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**1991-1993
GRADUATE
STUDIES
CATALOGUE**

**BRIGHAM
YOUNG
UNIVERSITY
BULLETIN
USPS No. 06512000**

This catalogue covers the 1991-93 academic years, but it will also be issued with a small alternate year supplement for 1992-93. The supplement will reflect major changes in such things as fees, programs, curricula, and deadlines and will replace the affected portions of this catalogue. The next full Graduate Studies Catalogue will be issued for the 1993-95 academic years.

To order a copy of this catalogue, please send \$5, plus \$1.50 for postage and handling, to Mail Services, 296 UPB, Brigham Young University, Provo, Utah 84602.

The university makes every effort to ensure the accuracy of the contents of this catalogue but reserves the right to make changes at any time without prior notice. Since change is a part of university life, curriculum and program changes will likely occur during the two-year period the 1991-93 Graduate Studies Catalogue is in circulation. Students are advised to consult the following sources for current and specific information:

1. The appropriate university department or advisor.
2. The Class Schedule, printed three times a year, which includes up-to-date information on courses offered, class hours, class locations, and the latest calendar dates, fees, and registration details.
3. A small supplement to the 1991-93 Graduate Studies Catalogue describing major changes made to curriculum, programs, and policies, which will be available in January 1992.

It is the student's responsibility to learn of and abide by current policies and requirements. In the event of change, every reasonable effort will be made to permit students affected to complete their programs or similar programs.

Statement of Nondiscrimination—Admission to Brigham Young University is nondiscriminatory. The university admits persons of any sex, race, creed, religion, or national origin who meet university and department academic requirements and agree to abide by the university's standards of conduct and honor code. Qualified handicapped students are admitted.

Volume 87, Number 10 December 21, 1990 Provo, Utah 84601
BRIGHAM YOUNG UNIVERSITY BULLETIN (USPS #06512000). Published by Brigham Young University, Provo, Utah 84602, trimonthly during August, bimonthly during March, April, and December, and monthly during October. Second-class postage paid at Provo, Utah 84601, and additional offices. POSTMASTER: Send address correction to BRIGHAM YOUNG UNIVERSITY BULLETIN, Provo, Utah 84602.

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12-90 9M Liberty Press

Where to Write or Call for Information

General Information on Graduate Education
Office of Graduate Studies
B-356 ASB, (801) 378-4091

Admissions
Graduate Admissions
B-356 ASB, (801) 378-7367

Campus Visits and Tours
Hosting Services
HOST, (801) 378-4678

Graduate School of Management
730 TNRB, (801) 378-4123

International Student Office
366 SWKT, (801) 378-2695

Law School Admissions
340 JRCB, (801) 378-4277

Records
B-150 ASB, (801) 378-2631

Registration
B-130 ASB, (801) 378-2824

Scholarships and Awards
Individual academic departments

Student Employment
Employment Office
C-40 ASB, (801) 378-3561

Student Housing
Housing Office
C-169 ASB, (801) 378-2611


Student Loans
Financial Aid Office
A-41 ASB, (801) 378-4104

Tests (GRE, GMAT, LSAT, and Miller)
Testing Services
265 HGB, (801) 378-6129

Tuition and Fees
Cashiers' Office
D-155 ASB, (801) 378-7808

Veterans Support Office
380 SWKT, (801) 378-2768





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The University

Brigham Young University offers an exceptional educational opportunity for the well-prepared graduate student who is seeking an environment where learning experiences with dedicated scholars characterize graduate study. Established and sponsored by The Church of Jesus Christ of Latter-day Saints, BYU is the largest privately owned university in the United States. The university president, Rex E. Lee, is directly responsible to the board of trustees, led by the President of The Church of Jesus Christ of Latter-day Saints and composed of Church authorities. In a time of constantly changing human values and increased challenges for higher education, BYU holds steadfastly to a singular vision that combines reasoned and revealed learning. Along with extensive undergraduate programs, BYU offers master's and doctoral degrees in a variety of disciplines through 57 graduate departments. In addition, the Law School and the Graduate School of Management offer professional graduate degrees.

Founded in 1875 as Brigham Young Academy, the campus has grown from one building to 500 buildings on more than 600 acres. Its first class of 29 students was taught by the academy's founding scholar, Karl G. Maeser. Now nearly 1,300 full-time faculty instruct more than 27,000 students. From its modest beginnings Brigham Young University has grown to become one of the nation's most distinguished institutions of private higher education. At BYU teaching and scholarly research are valued as essential complements of one another. Faculty and students work side by side in collegial scholarship enhanced by mutual commitment to the highest ideals of professional ethics and spiritual values.

Situated at the foot of the beautifully rugged Wasatch Range of the Rocky Mountains and bounded on the west by twenty-three-mile-long Utah Lake, the campus is the focal point of a city of 81,000 and a valley of 250,000. Beyond it to the south and east are spectacular areas of vast sandstone canyons and monoliths, several of which are national parks. Forty-five miles north is Salt Lake City.

The faculty at BYU have been schooled at some of the leading universities of the nation as well as of other countries, and many of them have achieved national and international prominence as teachers and scholars.



From the President . . .

With this Graduate Studies Catalogue let me welcome you to the university and to graduate studies. Your successful completion of an undergraduate degree has laid the groundwork for advanced study, but you will find that graduate work offers a new set of experiences. In the main, an undergraduate student tries to assimilate a largely prescribed set of information and skills that are already known by others. An undergraduate student, therefore, is primarily a consumer of knowledge. A graduate student must learn to become a contributor as well as a consumer, must become one who expands the world's store of knowledge. Faculty members and graduate students are partners in this important endeavor. Our libraries, laboratories, studios, museums, institutes, and centers will be home to you during the years you spend at Brigham Young University, and they will assist you in the task described above.

In the pages that follow you can learn about the university's degree requirements, procedures, and course offerings, as well as its distinctive mission and honor code. These pages suggest not only the many spiritual and intellectual opportunities for you here, but also the context in which you will study. Accomplished researchers and scholars will guide your efforts to observe more keenly, to contemplate more deeply, and to see more widely and insightfully than before. They will also assist you, finally, to express with clarity and grace what you have found. This is your challenge and your obligation.



Rex E. Lee

About This Catalogue

This catalogue serves as a graduate supplement to the Brigham Young University General Catalogue. General information about policies, procedures, services, and personnel that are not specific to graduate study are described in detail in that bulletin.

Introductory and concluding sections of this catalogue provide general information about graduate study at Brigham Young University, including details about admissions procedures and requirements that apply across the university. The large center portion of the catalogue contains graduate program descriptions and course listings; these appear in alphabetical order by department. Departments at BYU are organized into strong administrative college units, and graduate programs are the responsibility of college deans and department chairs. These college units are described beginning on page 37. Descriptions there include information about individual college research centers, facilities, and activities. Interdisciplinary facilities and programs appear in the college that has primary responsibility for them.

Policies and requirements in the general information section reflect standards of minimum performance and may be less stringent than those established by individual departments. Most departments have printed materials of their own describing in detail their programs, deadlines, expectations, and opportunities for financial assistance. Therefore, any potential applicants should notify prospective departments of their interest and request printed information from those departments. Because some application deadlines are as early as January, and some departments admit new students only once a year, early inquiry is recommended.

Entering students should plan their total study programs early in their first semester because most graduate courses are not offered every term or even every year. Missing a course one semester could mean a delay of one or more years for the student who fails to plan ahead. The university requires submission of a study list by the end of the student's first term or semester in a program.

The Law School and the Graduate School of Management publish their own bulletins, and they require a different application form than that used for other graduate programs. Furthermore, the Law School follows a different calendar. Prospective applicants to these professional schools should write directly to them.

The Administration of Brigham Young University

Board of Trustees of the University

Officers of the Board

<i>Chair</i>	Ezra Taft Benson
<i>First Vice Chair</i>	Gordon B. Hinckley
<i>Second Vice Chair</i>	Thomas S. Monson

Members of the Board

Howard W. Hunter	Russell M. Nelson
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L. Tom Perry	Elaine L. Jack
Neal A. Maxwell	Ardeth G. Kapp
	Harold F. Western, Secretary

Academic Officers of the University

<i>President</i>	Rex E. Lee
<i>Provost</i>	Bruce C. Hafen
<i>Academic Vice President and Associate Provost</i>	Stan L. Albrecht
<i>Associate Academic Vice Presidents</i>	J. R. Kearl
	J. Bevan Ott
	Dennis L Thompson
<i>Assistant Academic Vice President</i>	L. Robert Webb
<i>Administrative Vice President</i>	Dee F. Andersen
<i>Student Life Vice President</i>	R. J. Snow

Brigham Young University is fully accredited by the Northwest Association of Schools and Colleges. In addition, many professional programs of the university are reviewed, evaluated, and accredited by national and state associations and boards.

For a complete listing of university officers, of organizations that have given full accreditation to related programs at the university, and of educational associations with which the university is affiliated, see the BYU General Catalogue.

Mission of Brigham Young University

The mission of Brigham Young University—founded, supported, and guided by The Church of Jesus Christ of Latter-day Saints—is to assist individuals in their quest for perfection and eternal life. That assistance should provide a period of intensive learning in a stimulating setting where a commitment to excellence is expected and the full realization of human potential is pursued.

All instruction, programs, and services at BYU, including a wide variety of extracurricular experiences, should make their own contribution toward the balanced development of the total person. Such a broadly prepared individual will not only be capable of meeting personal challenge and change but will also bring strength to others in the tasks of home and family life, social relationships, civic duty, and service to mankind.

To succeed in this mission the university must provide an environment enlightened by living prophets and sustained by those moral virtues which characterize the life and teachings of the Son of God. In that environment these four major educational goals should prevail:

- All students at BYU should be taught the truths of the gospel of Jesus Christ. Any education is inadequate which does not emphasize that His is the only name given under heaven whereby mankind can be saved. Certainly all relationships within the BYU community should reflect devout love of God and a loving, genuine concern for the welfare of our neighbor.
- Because the gospel encourages the pursuit of all truth, students at BYU should receive a broad university education. The arts, letters, and sciences provide the core of such an education, which will help students think clearly, communicate effectively, understand important ideas in their own cultural tradition as well as that of others, and establish clear standards of intellectual integrity.
- In addition to a strong general education, students should also receive instruction in the special fields of their choice. The university cannot provide programs in all possible areas of professional or vocational work, but in those it does provide the preparation must be excellent. Students who graduate from BYU should be capable of competing with the best in their fields.
- Scholarly research and creative endeavor among both faculty and students, including those in selected graduate programs of real consequence, are essential and will be encouraged.

In meeting these objectives BYU's faculty, staff, students, and administrators should also be anxious to make their service and scholarship available to The Church of Jesus Christ of Latter-day Saints in furthering its work worldwide. In an era of limited enrollments, BYU can continue to expand its influence both by encouraging programs that are central to the Church's purposes and by making its resources available to the Church when called upon to do so.

We believe the earnest pursuit of this institutional mission can have a strong effect on the course of higher education and will greatly enlarge Brigham Young University's influence in a world we wish to improve.

Standards of Conduct

The Brigham Young University Code of Honor as established by the university and the board of trustees for all students under its jurisdiction in institutions of higher learning appears in the Graduate Studies Application Form and the BYU General Catalogue. The substance and essence of that code is described more fully in the following statement:

Brigham Young University is unique among universities. Governed by principles basic to its sponsoring church, The Church of Jesus Christ of Latter-day Saints, it purposefully creates and nurtures an environment in which faith and intellect join together in the pursuit of truth.

All members of the Brigham Young University community—students, faculty, staff, and administrators—agree to live by the values of the gospel of Jesus Christ as found in the standard scriptural works of the Church and the teachings of Church leaders past and present. In essence, then, those who study and work here promise to live lives of kindness, honesty, chastity, virtue, and faithfulness. They promise to do good to their neighbors and to seek after whatever is “virtuous, lovely, or of good report or praiseworthy” (13th Article of Faith).

Such behavior is firmly rooted in eternal principles that have been cherished and articulated by the prophets and other wise men and women throughout the history of civilization. The great thinkers, writers, artists, statesmen, and scientists have taught the importance of life with honor. Beyond the profound thoughts of these men and women, however, are the sacred, inspired writings of God’s prophets. Although good principles can be found in the best of human creations, the ultimate power of these and all true principles is found in the gospel of Jesus Christ.

In practical terms, this means a high standard of conduct is expected of those who join the university community. As sons and daughters of God, all at BYU must strive to grow steadily in faith, intelligence, love, and integrity. All agree to follow the moral teachings of Jesus Christ and the living prophets, and to be honorable and compassionate in their dealings with others. All agree to observe in letter and spirit the principles of health contained in the Word of Wisdom, specifically, to abstain from alcohol, tobacco, tea, and coffee, and from the abuse of drugs and other harmful substances. All agree to be honest in work and in human associations, never taking unfair advantage of others, never representing the work of others as their own, endeavoring to help others to reach their highest goals.

Code of Honor

Students and faculty members at Brigham Young University have prepared the Code of Honor, recognizing that it is a covenant between each person and all other members of the community, a covenant by which the community grants the privileges and opportunities of citizenship and each person within the community accepts two fundamental responsibilities: (1) to maintain personal integrity by living the code and (2) to maintain the integrity of the community by helping others live the code.

The successful functioning of the Code of Honor, indeed of the university itself, depends on mutual confidence and trust among students, faculty members, and staff. Unless each is assured that the other will uphold the

compact, the code will fail and the university will be diminished. Moreover, students and faculty members share a joint responsibility for hearing and evaluating reports of honor code infractions.

The university's very being is at stake in this matter. Its certification that a person has completed a class, a course of study, or the requirements for a degree is without value if the person obtained that certification through dishonesty. Similarly, a faculty member's name and university affiliation on the report of a piece of research must signify that the work and the report are honest. Examination papers, laboratory work, essays, theses, projects, research tools, and all other kinds of work for classes and degrees are to be prepared with no use having been made of unauthorized or undocumented materials of any kind. Students are not to give or receive aid in examinations or in class work where such is not permitted. Any individual violation of the Code of Honor compromises every member of the community; therefore, the entire community has a deep-rooted investment in the honesty of every person at BYU.

In essence, then, a scholarly publication, grade, certification, or diploma from Brigham Young University should and must have special and particular significance with regard to honor.

Dress and Grooming Standards

The attire and grooming of both men and women should always be modest, neat, clean, and appropriate. See the Graduate Studies application and the BYU General Catalogue for a detailed description of specific requirements. Registration at BYU constitutes an affirmative consent to abide by these standards and to represent the university and its sponsoring church in a manner that is becoming and dignified.

Continuing Ecclesiastical Endorsement

All continuing students must have a new continuing ecclesiastical endorsement each year by the April 1 deadline. LDS students must receive this endorsement from the bishop of the ward where they reside during winter semester. Non-LDS students may obtain an endorsement through an ecclesiastical officer of their choice or through the Student Life Office. A late fee will be assessed for any endorsement completed after the April 1 deadline. No student will be able to register for fall or subsequent semesters or terms without this new endorsement.

Graduate Study at Brigham Young University

Dean: Marilyn Arnold, Professor of English, B-380 ASB, 378-2274

Assistant Dean: Darwin L. Hayes, Associate Professor of English, B-360 ASB, 378-7307

Brigham Young University intends to be selective in the graduate programs it offers, to admit only highly qualified students, and to do very well those things it chooses to do. A university is a place where men and women of character meet minds and ideas that have shaped and will continue to shape human experience in significant ways. It is a place where people read and think and create and analyze, and where they give expression to ideas. It is a place of intellectual and moral broadening and deepening. The aim of advanced study is not to prove the old cliché about learning more and more about less and less, but to disprove it by contributing new knowledge and arriving at new levels of understanding.

In its statement of the principles of graduate education at Brigham Young University, the Graduate Council defines the essence of graduate study as "insight, seeing with 'new' eyes, hearing with 'new' ears, heightened perception leading to broader and deeper conception." Furthermore, the council states,

the measure of the quality of our graduate programs will not be how many students are involved, not how many jobs are available, nor for what salaries graduates are hired. Rather, it will be the degree to which the graduate work brings the student to new perspectives, the extent to which the experience gathers the practical within the theoretical, the extent to which programs enlighten necessary skills with universal understanding, the extent to which they lead students to the theoretical life—a life in which one learns not only to do, but to observe, to contemplate, to comprehend, to understand, and to see widely and clearly, and, finally, to express what has been found.

Brigham Young University offers doctoral and master's degrees in a broad range of fields, as well as professional degrees in law and management. The doctoral degree requires the student to demonstrate a high level of scholarly competence, which includes the ability to conduct and report significant research in a highly effective way. Advanced systematic study in a discipline is also essential, and it is followed by comprehensive examinations that require students to integrate and understand the collective knowledge of their disciplines. An impeccably written dissertation resulting from independent research is scrutinized and tested in a concluding oral examination. The master's degree also requires advanced course work, demonstrated mastery in vital aspects of a discipline, skill in research methodology and theory, and preparation for future creative work. Nearly all master's programs at Brigham Young University require integrating examinations and a major culminating piece of written work—usually a thesis, sometimes a project—and an oral examination on that work.

The Graduate Council

Consisting of senior faculty members from a variety of disciplines, and chaired by one of its own members, the Graduate Council is one of six faculty groups with major responsibility for academic programs and standards across the campus. The others are the Faculty Advisory Council, the Curriculum Council, the General Education Council, the Library Council, and the Council on Continuing Status and Advancement in Rank.

The primary responsibility of the council is to establish and maintain standards of quality in graduate education at Brigham Young University. In discharging this responsibility, the council sets policy, conducts extensive reviews of colleges and departments, evaluates proposals for new programs, and makes recommendations to the provost on a variety of issues affecting graduate education. In addition, its members work in teams to improve the quality of individual programs.

The goal of the council is to ensure that only truly excellent graduate programs are offered at BYU. Thus, the university is engaged in a continuing effort to consolidate resources behind strong programs and withdraw them from weaker ones. The number of programs is being reduced and remaining programs are being strengthened, resulting in a better, more demanding graduate experience.

Current members of the Graduate Council are:

1990-91

Robert K. Conlee, Chair, Physical Education—Sports
Rex G. Cates, Botany and Range Science
C. Wilfred Griggs, Ancient Scripture
Tim B. Heaton, Sociology
Gary F. McKinnon, Business Management
Rosalie Rebollo Pratt, Music
D. Ray Reutzell, Elementary Education
Stephen L. Tanner, English

1991-92

Robert K. Conlee, Chair, Physical Education—Sports
Tim B. Heaton, Sociology
Gary F. McKinnon, Business Management
D. Ray Reutzell, Elementary Education
Stephen L. Tanner, English

The Office of Graduate Studies

Although departments and colleges carry the major responsibility for graduate programs at BYU, certain kinds of things are done centrally. The admissions process begins in the Office of Graduate Studies, B-356 ASB, and progress toward a degree is recorded there. The office also maintains standards and requirements that apply uniformly across campus and serves as a clearinghouse for questions, problems, exceptions to policy, and requests for policy changes. The office is staffed by advisors thoroughly familiar with policies and procedures at the general university level. It is in the student's home department, however, that the most important advising is done in regard to individual program requirements and procedures. It is essential that a student consult frequently with departmental advisors. In many instances department requirements exceed university minimums.

University Library

University Librarian: Sterling J. Albrecht, 3080 HBLL, 378-2905

Associate University Librarian: A. Dean Larsen, 3080 HBLL, 378-4304

Assistant University Librarian: K. Paul Jordan, 3080 HBLL, 378-6761

Assistant University Librarian: Randy J. Olsen, 3080 HBLL, 378-2908

Assistant University Librarian: Larry J. Ostler, 3080 HBLL, 378-6724

Housing nearly three million volumes including an extensive collection of pamphlets, journals, current serials, newspapers, microform titles, and nonprint materials, the Harold B. Lee Library is a major resource for graduate student research. It is a depository for United States and Canadian government documents and regularly receives publications of state and local governments. Some of the library's strengths include special research collections in music in the areas of film, radio, viola, and harp. Notable collections have also been established in early modern European history, Renaissance Reformation history, American Church history, western Americana, Mormon Americana, nineteenth-century British literature, and the history of astronomy. Although many volumes of these collections are found in open stacks, most of the special collections are located on the fourth of the library's five levels. The Archives and Manuscripts Division is on the fifth level.

BYU participates in several cooperative programs that allow students and faculty to use materials housed in other state institutions and major research libraries throughout the United States:

1. **Interlibrary Loan services** (Kathleen Hansen, 3437 HBLL, 378-6344) allow students to borrow books from other institutions. Photocopies of journal articles may be obtained for photocopying costs. A RUSH telefacsimile service is also available.
2. Through the **Utah College Library Council** arrangements have been made that allow students with valid BYU ID cards to borrow materials from other college and university libraries in the state.
3. The **Research Libraries Group** is a national consortium of thirty-six major research libraries that work together to improve access to library resources necessary in scholarly research. The benefits of membership in this group include priority treatment of interlibrary loan requests from many major U.S. libraries (e.g., Yale, Princeton, Stanford, University of Michigan) and the availability of some materials that normally do not circulate. This group also sponsors a computerized shared-cataloguing system that provides access to the computerized portion of the card catalogues of member libraries. Inquiries are handled at the reference desk on the main floor (level 3, 378-2927).
4. The **Center for Research Libraries** is an organization whose objective is to increase the availability of research materials to its more than 180 member institutions. Through this organization, many infrequently used materials are deposited in a common pool from which all members may borrow. BYU students may borrow from the center's collection of archives, dissertations, government documents, journals, monographs, and newspapers. Inquiries are handled at the Interlibrary Loan Office.

5. **BYU's Computer-assisted Research Services**, through access to more than 200 computerized data bases, provide bibliographic references on a given topic. There is a charge for computer connect time, but not for consultation services. Inquiries are handled in 3230 HBLL, 378-5627.

The library also provides a number of special services for graduate students. For example, some study carrels are available by assignment to graduate students (doctoral students have priority), and graduate students may check out circulating books for eight weeks rather than two (the undergraduate limit). Furthermore, research personnel in the library, in addition to reference desk staff, will work individually and in depth with graduate students on their research projects and theses.

The facilities of other libraries operated by The Church of Jesus Christ of Latter-day Saints are also available to Brigham Young University students. The Family History Library in Salt Lake City contains approximately 100,000 books and more than 800,000 rolls of microfilm. A regional family history library, operating under the general direction of the Church Family History Department, is located on the fourth level of the Harold B. Lee Library. The library of the Church Historical Department is also available by arrangement to advanced students for research. This facility is in the LDS Church Office Building in Salt Lake City.

University Graduate Studies Calendar

Fall Semester 1991

- February 27 Last day international applicants may submit completed applications for fall semester 1991 admission
- March 1 Financial aid priority deadline for Guaranteed Student Loans and BYU loans
- April 1 Last day to submit ecclesiastical endorsement without a late fee.
- May 15 Last day for U.S., Canadian, and permanent-resident applicants, as well as international applicants living in the U.S., to submit completed applications for fall semester 1991 admission
- July 1 Last day to apply for BYU short-term loans from Financial Aid Office to pay fall semester tuition by the payment deadline
- August 15 Tuition payment deadline for fall semester 1991 to avoid late fee
- 26, 27, 28 Annual University Conference
- 30 Last day to pay tuition with \$50 late fee
- September 2 Labor Day holiday
- 3 Classes begin. Late tuition fee increased to \$90
- 3 In-person late registration for students who did not use the advance registration system
- 4 Last day to drop classes without a fee per class
- 16 Last day to late register or add classes. Classes dropped after this date will appear with W (official withdrawal) on the transcript
- 16 Last day to pay tuition with late fee
- 20 Last day graduate students may apply for December 1991 graduation (graduation fee must be paid)
- October 7 Last day to drop continuous classes for academic reasons
- November 8 Last day students in dissertation, thesis, or selected project programs may schedule a final oral examination (defense of their work) and submit one copy of their work to the Reserve Library
- 22 Last day graduate students in dissertation, thesis, or selected project programs may have a final oral examination (defense of their work)
- 26 Last day to officially withdraw from the university or drop classes for nonacademic emergencies
- 28, 29 Thanksgiving Day holiday
- December 6 Last day graduate students may submit final copies of a dissertation, thesis, or selected project to the library for binding
- 11 Last day of class instruction
- 12-14 Reading days

- 13 Last day graduate students may complete requirements for a degree, pay fees, and submit examination results (oral or written) and grade changes for I's, T's, etc., to the Office of Graduate Studies
- 16–20 Final examinations
- 20 December graduation (no commencement exercises)

Winter Semester 1992

- June 30 Last day international applicants may submit completed applications for winter semester 1992 admission
- September 15 Last day for U.S., Canadian, and permanent-resident applicants, as well as international applicants living in the U.S., to submit completed applications for winter semester 1992 admission
- November 1 Last day to apply for BYU short-term loans from Financial Aid Office to pay winter semester tuition by the payment deadline
- December 15 Tuition payment deadline for winter semester 1992 to avoid late fee
- January 4 Last day to pay tuition with \$50 late fee
 - 6 Classes begin. Late tuition fee increased to \$90
 - 6 In-person late registration for students who did not use the advance registration system
 - 7 Last day to drop classes without a fee per class
 - 17 Last day to late register or add classes. Classes dropped after this date will appear with W (official withdrawal) on the transcript
 - 17 Last day to pay tuition with late fee
 - 20 Martin Luther King Day holiday
 - 24 Last day graduate students may apply for April 1992 graduation (graduation fee must be paid)
- February 10 Last day to officially withdraw from the university without being graded
 - 17 Presidents' Day holiday
 - 21 Last day graduate students in dissertation, thesis, or selected project programs may schedule a final oral examination (defense of their work) and submit one copy of their work to the Reserve Library
- March 6 Last day graduate students in dissertation, thesis, or selected project programs may have a final oral examination (defense of their work)
 - 13 Last day graduate students may submit final copies of a dissertation, thesis, or selected project to the library for binding
 - 20 Last day graduate students may complete remaining requirements for a degree, pay fees, and submit examination results (oral or written) and grade changes for I's, T's, etc., to the Office of Graduate Studies
 - 31 Last day to officially withdraw from the university or drop classes for nonacademic emergencies
- April 14 Last day of class instruction

- 15–17 Reading days
- 18, 20–23 Final examinations
- 23 Graduation—university commencement
- 24 Graduation—college convocations

Spring Term 1992

- October 30 Last day international applicants may submit completed applications for spring term admission
- February 20 Last day for U.S., Canadian, and permanent-resident applicants, as well as international applicants living in the U.S., to submit completed applications for spring term 1992 admission
- March 1 Last day to apply for BYU short-term loans from Financial Aid Office to pay spring term tuition by the payment deadline
- April 1 Last day to submit ecclesiastical endorsement without a late fee
 - 22 Tuition payment deadline for spring term to avoid \$25 late fee
 - 29 Classes begin
 - 29 In-person late registration for students who did not use the advance registration system
 - 30 Last day to pay tuition with \$25 late fee
 - 30 Last day to drop classes without a fee per class
- May 6 Last day to late register or add classes. Classes dropped after this date will appear with W (official withdrawal) on the transcript
 - 6 Last day to pay tuition with late fee
 - 15 Last day to officially withdraw from the university without being graded
 - 15 Last day graduate students may apply for August 1992 graduation (graduation fee must be paid)
 - 25 Memorial Day holiday
- June 3 Last day to officially withdraw from the university or drop classes for nonacademic emergencies
 - 17 Last day of class instruction
 - 18 Reading day
 - 19 Last day graduate students in dissertation, thesis, or selected project programs may schedule a final oral examination
- 19, 20 Final examinations

Summer Term 1992

- December 31 Last day international applicants may submit completed applications for summer term 1992 admission
- April 1 Last day to submit ecclesiastical endorsement without a late fee

- 15 Last day for U.S., Canadian, and permanent-resident applicants, as well as international applicants living in the U.S., to submit completed applications for summer term 1992 admission
- May 1 Last day to apply for BYU short-term loans from Financial Aid Office to pay summer term tuition by the payment deadline
- May 15 Last day graduate students may apply for August 1992 graduation (graduation fee must be paid)
- June 17 Tuition payment deadline for summer term to avoid \$25 late fee
 - 19 Last day graduate students in dissertation, thesis, or selected project programs may schedule a final oral examination (defense of their work) and submit one copy of their work to the Reserve Library
 - 22 Classes begin
 - 22 In-person late registration for students who did not use the advance registration system
 - 23 Last day to drop classes without a fee per class
 - 29 Last day to late register or add classes. Classes dropped after this date will appear with W (official withdrawal) on the transcript
 - 29 Last day to pay tuition with late fee
- July 2 Last day graduate students in dissertation, thesis, or selected project programs may have a final oral examination (defense of their work)
 - 3 Independence Day holiday
 - 9 Last day to officially withdraw from the university without being graded
 - 10 Last day graduate students may submit final copies of a dissertation, thesis, or selected project to the library for binding
 - 17 Last day graduate students may complete remaining requirements for a degree, pay fees, and submit examination results (oral or written) and grade changes for I's, T's, etc., to the Office of Graduate Studies
 - 24 Pioneer Day holiday
 - 28 Last day to officially withdraw from the university or drop classes for nonacademic emergencies
- August 10 Last day of class instruction
 - 11 Reading day
 - 12, 13 Final examinations
 - 13 Graduation—university commencement
 - 14 Graduation—college convocations

Complete List of Graduate Degrees Offered at BYU

The *University* application deadlines are listed in the Admissions section of this catalogue. Deadline dates shown in this chart as other than university are for U.S., Canadian, and permanent-resident applicants only; international deadlines, if other than university, are generally one month earlier. Prospective international applicants can obtain from Graduate Admissions a listing of all international application deadlines for specific programs.

Department/Field	Degree	Entry Semester(s)	Application Deadlines	Entrance Exam	Recommended Score
Agronomy and Horticulture					
Agronomy	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Horticulture	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Animal Science	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Anthropology	M.A.	Fall, winter	University	GRE (GEN: Q,V,A)	Subject to review
Art					
Art Education*	M.A.	All	Mar 1, Sep 1		
Art History	M.A.	Fall, winter	Mar 1, Sep 1		
Ceramics	M.F.A.	Fall, winter	Mar 1, Sep 1		
Painting-Drawing	M.F.A.	Fall, winter	Mar 1, Sep 1		
Printmaking-Drawing	M.F.A.	Fall, winter	Mar 1, Sep 1		
Sculpture	M.F.A.	Fall, winter	Mar 1, Sep 1		
*Financial assistance awarded fall only.					
Botany and Range Science					
Biological Science Education	M.S.	Fall	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
Botany	M.S.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
	Ph.D.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
Genetics	M.S.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
	Ph.D.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
Range Science	M.S.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
Wildlife and Range Resources	M.S.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
	Ph.D.	All	University	GRE (GEN: Q,V,A) (SUBJ: Biology)	1100 (Q,V) 50th percentile
Chemistry					
Biochemistry	M.S.	Fall recommended	Earlier*	GRE recommended (SUBJ: Adv Chem)	Subject to review
Biochemistry	Ph.D.	Fall recommended	Earlier*	GRE recommended (SUBJ: Adv Chem)	Subject to review

Department/Field	Degree	Entry Semester(s)	Application Deadlines	Entrance Exam	Recommended Score
Chemistry	M.S.	Fall recommended	Earlier*	GRE recommended (SUBJ: Adv Chem)	Subject to review
	Ph.D.	Fall recommended	Earlier*	GRE recommended (SUBJ: Adv Chem)	Subject to review
*See Chemistry section of this catalogue for specific dates.					
Communications	M.A.	Fall	University	MAT	Subject to review
Computer Science	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
	Ph.D.	Fall, winter	Mar 15, Jun 15	GRE (GEN: Q,V,A) (SUBJ: Computer Sci)	Subject to review
Economics					
Applied Economics	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Education					
Educational Leadership	M.Ed.	Fall, winter, summer	May 1, Sep 1 Apr 1	GRE (GEN: Q,V,A)	Q+V=900; A=500
	Ed.D.	All	University	GRE (GEN: Q,V,A)	Q+V=1000; A=500
	Ph.D.	Fall, winter, summer	Apr 1, Sep 1, Jan 15	GRE (GEN: Q,V,A)	Q+V=1100 A=500
Educational Psychology	M.S.	Fall	Feb 15	GRE (GEN: Q,V,A)	Subject to review
	Ph.D.	Fall	Feb 15	GRE (GEN: Q,V,A) (SUBJ: Educ or Psych)	Subject to review
Educational Psychology	M.S.	Fall, summer	Feb 15	GRE (GEN: Q,V,A)	
	M.Ed.	Fall, summer	Feb 15	GRE (GEN: Q,V,A)	
Speech/Language Pathology	M.S.	Fall	Feb 15	GRE (GEN: Q,V,A)	Subject to review
Elementary Education					
Teaching and Learning	M.A.	Fall, winter, summer	University	GRE (GEN: Q,V,A)	Subject to review
	M.Ed.	Fall, winter, summer	University	GRE (GEN: Q,V,A)	Subject to review
Reading	Ed.D.	Fall, winter, summer	University	GRE (GEN: Q,V,A)	Subject to review
Instructional Science					
Instructional Science	M.S.	Fall, summer recommended	University	GRE (GEN: Q,V,A)	Subject to review
	Ph.D.	Fall, summer recommended	University	GRE (GEN: Q,V,A)	Subject to review
Instructional Psychology	Ph.D.	Fall, summer recommended	University	GRE (GEN: Q,V,A)	Subject to review
Engineering					
Collegewide Engineering Programs					
Engineering Management	M.E.M.	Fall, spring	University	GRE (GEN: Q,V,A)*	Subject to review
Technology Management	M.T.M.	Fall, spring	University	GRE (GEN: Q,V,A)*	Subject to review
*GRE (GEN: Q,V,A) required only of students applying from nonaccredited universities.					
Chemical Engineering					
Chemical Engineering	M.S.	U.S.: All Int'l: Fall	University	U.S., Canadian Int'l: GRE (GEN: Q,V,A) (SUBJ: Engineering)	None; percentile (SUBJ)=80th percentile; TOEFL=575
Engineering	Ph.D.	U.S.: All Int'l: Fall	University	Same as for M.S.	

Department/Field	Degree	Entry Semester(s)	Application Deadlines	Entrance Exam	Recommended Score
Civil Engineering					
Civil Engineering	M.S.	All	University	U.S., Canadian Int'l: GRE (GEN: Q,V,A) (SUBJ: Engineering) Int'l: TOEFL	None percentile (SUBJ)=80th percentile; TOEFL=575
Engineering	Ph.D.	All	University	Same as for M.S.	
Electrical and Computer Engineering					
Electrical Engineering	M.S.	U.S.: All Int'l: Fall	University	None	N/A
Engineering	Ph.D.	U.S.: All Int'l: Fall	University University	U.S., Canadian Int'l: GRE (GEN: Q,V,A) (SUBJ: Engineering) Int'l: TOEFL	None TOEFL=575
Manufacturing Engineering and Engineering Technology					
Computer-integrated Manufacturing	M.S.	All	University	GRE (GEN: Q,V,A) Int'l: TOEFL	1650 TOEFL=575
Mechanical Engineering					
Mechanical Engineering	M.S.	All	University	U.S., Canadian GRE (GEN: Q,V,A) (SUBJ: Engineering) Int'l: TOEFL	Pass FE (EIT); 1750 640 TOEFL=575
Engineering	Ph.D.	All	University	U.S., Canadian GRE (GEN: Q,V,A) (SUBJ: Engineering)	1750 640
English	M.A.	Fall	Mar 15	GRE (SUBJ: Literature)	70th percentile
Family Sciences					
Family Sciences	M.S.	Fall	Feb 1	GRE (GEN: Q,V,A)	Subject to review
	Ph.D.	Fall	Feb 1	GRE (GEN: Q,V,A)	Subject to review
Family Studies	Ph.D.	Fall	Feb 1	GRE (GEN: Q,V,A) encouraged but not required	Subject to review
Marriage and Family Therapy	M.S.	Fall	Feb 1	GRE (GEN: Q,V,A)	Subject to review
	Ph.D.	Fall	Feb 1	GRE (GEN: Q,V,A)	Subject to review
Food Science and Nutrition					
Food Science and Nutrition	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Food Science	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Nutrition	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
Geography					
Cartography	M.S.	All	University	None	N/A
Geography	M.S.	All	University	None	N/A
Planning	M.S.	All	University	None	N/A
Geology					
Geology	M.S.	Fall, winter	Mar 15, Sep 15	GRE (GEN: Q,V,A)	50th percentile
Health Sciences					
	M.S.	All	University	GRE (GEN: Q,V,A)	Subject to review
	M.H.Ed.	All	University	GRE (GEN: Q,V,A)	Subject to review
History					
	M.A.	Fall	Mar 1	GRE (GEN: Q,V,A) Int'l: TOEFL	Subject to review TOEFL=582
	Ph.D.	Fall	Mar 1	GRE (GEN: Q,V,A) Int'l: TOEFL	Subject to review TOEFL=582

Graduate Degrees

Department/Field	Degree	Entry Semester(s)	Application Deadlines	Entrance Exam	Recommended Score
Humanities, Classics, and Comparative Literature					
Comparative Literature	M.A.	All	University	GRE (GEN: Q,V,A)	Subject to review
Humanities	M.A.	All	University	GRE (GEN: Q,V,A)	Subject to review
Industrial Education	M.S.	All	University	None	N/A
International and Area Studies	M.A.	Fall	Apr 1	GRE (GEN: Q,V) Int'l: TOEFL	1100 TOEFL=580
Languages					
Language Acquisition	M.A.	Fall, winter, but fall recommended	University	None	
Arabic					
Chinese					
German					
Japanese					
Korean					
Portuguese					
Russian					
Scandinavian					
Spanish					
Germanic and Slavic Languages					
German Literature	M.A.	Fall, winter	Apr 1, Aug 1	GRE (GEN: Q,V,A)	Subject to review
Spanish and Portuguese					
Portuguese Language	M.A.	All	University	None	N/A
Portuguese Literature	M.A.	All	University	None	N/A
Spanish Language	M.A.	All	University	Departmental*	N/A
Spanish Literature	M.A.	All	University	Departmental*	N/A
Spanish Teaching	M.A.	All	University	Departmental*	N/A
*Applicants may be required to have an oral interview or produce a tape to demonstrate language proficiency.					
Law	M.C.L.	Fall	Feb 15	LSAT	Subject to review
	J.D.	Fall	Feb 15	LSAT	Subject to review
Library and Information Sciences	M.L.I.S.	Fall, winter spring, summer	May 1, Sep 1, Feb 6, Apr 1	None	N/A
Linguistics					
Linguistics	M.A.	Fall recommended	University	Int'l: Departmental English proficiency exam Int'l: TOEFL	Pass TOEFL=580
Teaching English as a Second Language	TESL	Fall recommended	University	Int'l: Departmental English proficiency exam Int'l: TOEFL	Pass TOEFL=580
Teaching English as a Second Language	M.A.	Fall recommended	University	Int'l: Departmental English proficiency exam Int'l: TOEFL	Pass TOEFL=580
Management					
School of Accountancy					
Information Systems— Auditing	M.Acc.	Consult with the SOA Office	University	GMAT	500
Information Systems— Consulting	M.Acc.	Consult with the SOA Office	University	GMAT	500

Department/Field	Degree	Entry Semester(s)	Application Deadlines	Entrance Exam	Recommended Score
Management Accounting	M.Acc.	Consult with the SOA Office	University	GMAT	500
Tax	M.Acc.	Consult with the SOA Office	University	GMAT	500
Master of Business Administration					
Business Administration	M.B.A.	Fall	University	GMAT	500
Organizational Behavior	M.O.B.	Fall	University	GMAT or GRE	Subject to review
Institute of Public Management					
Public Administration	M.P.A.	Fall	University	GMAT	500
Managerial Economics	M.S.	All	University	GRE (GEN: Q,V,A) or GMAT	Subject to review
Mathematics					
Mathematics Education	M.A.	All	University	U.S.: GRE recommended Int'l: GRE required	Subject to review
Mathematics	M.A.	All	University	U.S.: GRE recommended Int'l: GRE required	Subject to review
	M.S.	All	University	GRE (GEN: Q,V,A) (SUBJ: Mathematics)	Subject to review
	Ph.D.	All	University	GRE (GEN: Q,V,A) (SUBJ: Mathematics)	Subject to review
Microbiology					
Medical Technology	M.S.	All	University	GRE (GEN: Q,V,A)	1600
Microbiology	M.S.	All	University	GRE (GEN: Q,V,A)	1600
	Ph.D.	All	University	GRE (GEN: Q,V,A)	1600
Music					
Composition	M.M.	Fall	Mar 1	GRE Music Test*	Subject to review
Music Education	M.A.	Summer	Mar 1	GRE Music Test*	Subject to review
	M.M.	Summer	Mar 1	GRE Music Test*	Subject to review
Musicology	M.A.	Fall	Mar 1	GRE Music Test*	Subject to review
	Ph.D.	Fall	Mar 1	GRE Music Test*	Subject to review
Performance and Pedagogy	M.M.	Fall	Mar 1	GRE Music Test*	Subject to review
*Applicants to music graduate programs have additional requirements outlined in the Department of Music Graduate Handbook, 5th edition.					
Nursing	M.S.	Fall, winter	University	None	
Physical Education—Dance	M.A.	All	University	GRE (GEN: Q,V,A)	Subject to review
Physical Education—Sports					
Corrective Physical Education and Rehabilitation	Ph.D.	Fall, summer	University	GRE (GEN: Q,V,A)	1530
Exercise Physiology	Ph.D.	Fall, summer	University	GRE (GEN: Q,V,A)	1530
Exercise Science and Athletic Training	M.S.	Fall, summer	University	GRE (GEN: Q,V,A)	1380
Physical Education	M.Ed.	Fall, summer	University	GRE (GEN: Q,V,A)	1380
Physical Education Administration, Curriculum, and Instruction	Ed.D.	Fall, summer	University	GRE (GEN: Q,V,A)	1530
Physics and Astronomy					
Physics	M.S.	Fall recommended	Feb 15	GRE (SUBJ: Physics)	40th percentile
	Ph.D.	Fall recommended	Feb 15	GRE (SUBJ: Physics)	60th percentile*

Graduate Degrees

Department/Field	Degree	Entry Semester(s)	Application Deadlines	Entrance Exam	Recommended Score
Physics and Astronomy	Ph.D.	Fall recommended	Feb 15	GRE (SUBJ: Physics)	60th percentile*
*Although a student may be admitted with a score in the 60th percentile, the student must retake the examination and earn a score in the 80th percentile or higher before the end of the first year of graduate work.					
Psychology					
Clinical Psychology	Ph.D.	Fall	Jan 31	GRE (GEN: Q,V,A)	Subject to review
Psychology	Ph.D.	Fall	Jan 31	GRE (GEN: Q,V,A)	Subject to review
Psychology	M.S.	Fall	Jan 31	GRE (GEN: Q,V,A)	Subject to review
School Psychology	SPC	Fall	Mar 31	GRE (GEN: Q,V,A)	Subject to review
Recreation Management and Youth Leadership					
Recreation Management and Youth Leadership	M.A.	All	University	None	N/A
Therapeutic Recreation	M.A.	All	University	None	N/A
Social Work	M.S.W.	Fall	Feb 1		
Sociology					
Sociology	M.S.	All	Earlier*	GRE encouraged but not required	Subject to review
Family Studies	Ph.D.	Fall	Feb 1	GRE encouraged but not required	Subject to review
Sociology	Ph.D.	All	Earlier*	GRE encouraged but not required	Subject to review
*See Sociology section of this catalogue for specific dates.					
Statistics	M.S.	All*	University	GRE (GEN: Q,V,A) (SUBJ: Mathematics) Int'l: TOEFL	Subject to review TOEFL=580
*See Statistics section of this catalogue for clarification.					
Theatre and Film					
Film	M.F.A.	Fall	Feb 15	GRE (GEN: Q,V,A)	Subject to review
Theatre and Film	M.A.	Fall, summer	Feb 15	GRE (GEN: Q,V,A)	Subject to review
	Ph.D.	Fall, summer	Feb 15	GRE (GEN: Q,V,A)	Subject to review
Theatre Design and Technology	M.F.A.	Fall	Feb 15	GRE (GEN: Q,V,A)	Subject to review
Zoology					
Biological Science Education	M.S.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile
Entomology	M.S.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile
	Ph.D.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile
Wildlife and Range Resources	M.S.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile
	Ph.D.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile
Zoology	M.S.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile
	Ph.D.	Fall	Mar 1	GRE (GEN: Q,V,A) (SUBJ: Biology)	1600 50th percentile

General Information

Tuition and Fees

Cashiers' Office
D-155 ASB, 378-7808

All students who register at BYU must pay full tuition and fees (in U.S. dollars) at the time of registration. Fees are to be paid at the Cashiers' Office, but questions regarding fee assessment should be addressed to Financial Services (D-148 ASB). The university reserves the right to change tuition and fees without notice.

Because students beyond the baccalaureate degree typically make a heavier demand on university resources than undergraduate students do, they are assessed at a higher tuition rate.

Full-Time and Part-Time Tuition Assessment. Students assessed full-time tuition pay a fixed rate of tuition; students assessed part-time tuition pay for the number of credit hours taken.

Full-time: 8.5 or more hours in a semester
4.5 or more hours in a term

Part-time: Fewer than 8.5 hours in a semester
Fewer than 4.5 hours in a term

Note: A fraction of an hour is counted as a full hour for assessing fees.

Audited Courses. The charge for auditing a course (attending class but not receiving a grade or credit) is the same as for taking the course for credit. Audited courses do not appear on the transcript.

Tuition

A significant portion of the cost of operating the university is paid from the tithes of The Church of Jesus Christ of Latter-day Saints. Therefore, students and families of students who are tithe-paying members of the Church have already made a contribution to the operation of the university. Because others have not so contributed, they are charged a higher rate of tuition. This practice is similar in principle to that of state universities that generally charge nonresidents at a higher rate than residents.

1991-92 Tuition Schedule

Per Semester (Fall or winter)		Per Term (Spring or summer)	
LDS	Non-LDS	LDS	Non-LDS
Advanced-standing Students (other than students in the Law School and Graduate School of Management)			
Full-Time			
\$1,170	\$1,755	\$585	\$877
Part-Time			
\$130 per cr. hr.	\$195 per cr. hr.	\$130 per cr. hr.	\$195 per cr. hr.
Graduate School of Management and Law School Students			
Full-Time			
\$1,890	\$2,835	\$945	\$1,417
Part-Time			
\$210 per cr. hr.	\$315 per cr. hr.	\$210 per cr. hr.	\$315 per cr. hr.

Fees

Late Registration Fee. Full-time and part-time students who fail to complete registration by the deadlines are assessed the following nonrefundable late registration fees:

Semester late fee:

Fee for tuition paid late,
before the first day of classes \$50

Fee for tuition paid late,
after classes begin \$25

Students whose tuition check is not honored by the bank will be charged the late fee in effect at the time the check is redeemed.

Class Fees. Some courses require a fee in addition to tuition, to be paid upon registration. See course listings.

Miscellaneous General Fees

The university assesses fees for a variety of services. The following apply specifically to graduate education:

Application fee (nonrefundable)	
New applying student	\$30
Reapplying student	\$30
Graduation fee (nonrefundable)	
Master's degree	\$20
Doctoral degree	\$25
Graduate minimum registration fee (for graduate students using university facilities without formal registration for university classes)	
LDS	\$260
Non-LDS	\$390
Microfilming of dissertation (doctoral students only)	\$45*
Special examination fee	
Nonrefundable fee for each course challenged	\$10
Additional per-credit-hour charge upon successful completion of exam	\$15
Thesis binding (four copies*)	\$34

*Subject to change without notification.

Admissions

Graduate Admissions

B-356 ASB, 378-7310

International Admissions

B-356 ASB, 378-7367

Applications for admission to graduate study, except for Law School and the Graduate School of Management, are available from Graduate Admissions, B-356 ASB. The Law School (338 JRCB) and the Graduate School of Management (730 TNRB) use different forms, which they furnish on request.

A preliminary application, which includes all the international application deadlines for specific programs, can be obtained from Graduate Admissions.

Deadlines for Graduate Applications

Most departments and programs require that all parts of the application be received and completed by the deadlines listed below, but some departments

have earlier deadlines and will not consider late applications.

Entry Time	Deadlines for U.S., Canadian, and Permanent- Resident Applicants	Deadlines for International Applicants
Fall (September)	May 15	February 27
Winter (January)	September 15	June 30
Spring (April)	February 20	October 30
Summer (June)	April 15	December 31

Note:

1. Application materials must be submitted to Graduate Admissions, B-356 ASB.
2. Some programs admit only once each year, and application deadlines may be earlier than those listed above. Applicants are advised to ask departments for specific dates.
3. Some programs require additional application materials such as test scores, portfolios, and entrance examinations. Applicants are advised to ask departments about specific requirements.
4. Students applying concurrently to more than one program must make separate application to each and pay a separate fee for each, but they need only submit one Part B.

Application Requirements

Admission to graduate study is highly selective and is granted to a specific program for a specific semester or term. As a minimum, applicants who wish to be considered for admission must do the following:

U.S. Applicants

1. Submit a *complete* application *before* the application deadline. An application is not considered complete until the application fee has been paid and all official transcripts, letters of recommendation, the statement of intent, and the confidential report are in, as well as Parts A and D of the admissions application.
2. Agree to maintain university standards of personal conduct.

3. Have received or be about to receive a baccalaureate degree from an accredited U.S. or Canadian university. The Office of Graduate Studies must receive an official transcript showing that the degree has been conferred. Without such verification, registration will not be permitted beyond the first semester.
4. Have earned at least a 3.0 GPA in the last 60 semester hours of course work.
5. All applicants for whom English is not the native language: Submit evidence of proficiency in English—a score of at least 550 on the TOEFL. Some departments have a higher requirement.
6. Satisfy departmental requirements for consideration, including national examinations (such as the GRE) specified by the department.
6. Submit a TOEFL score of at least 550. This is required of all applicants for whom English is not the native language. Students with a bachelor's degree from a U.S. or Canadian university are usually exempt from this requirement. Some departments require a higher minimum score.
7. Submit a completed Financial Certification and Visa Information form, with supporting documents. Applicants must provide proof of sufficient funds for the total length of their program of study.
8. Satisfy departmental requirements for consideration.

International Applicants (all non-U.S.)

Note: Brigham Young University will not process applications from applicants entering the United States with a B visa. An admitted student will receive an I-20 or IAP-66 form (Certificate of Eligibility) with the official letter of acceptance; the I-20 and IAP-66 are used to obtain a student visa (F-1 or J-1).

1. Submit a complete application before the application deadline. An application is not considered complete until the application fee has been paid and all official transcripts, official evidence of degrees earned, letters of recommendation (Part C), the statement of intent, official TOEFL score, financial certification, and the Code of Honor commitment and confidential report (Part B) are in, as well as Parts A and D of the admissions application.
2. Agree to maintain university standards of personal conduct.
3. Submit official transcripts from each institution attended, with accompanying certified English translation.
4. Submit a copy of a diploma (preparation completed at least equivalent to a U.S. bachelor's degree), with accompanying official English translation.
5. Have earned at least a 3.0 GPA (on a 4.0 scale) for all previous undergraduate work.

Full Disclosure Requirement

All information and documents required for admission must be submitted, including transcripts from every institution attended. Incomplete information or falsification of information constitutes grounds for immediate dismissal and loss of all credit earned at BYU. Once the university receives application materials, those materials become the property of the university and are kept in the strictest confidence as required by university policy. Once the parts of an application have been received, materials will not be returned to an applicant.

Admissions Process

Graduate Admissions receives and checks all parts of the application for completeness. Information for the department (Part D), the statement of intent, one copy of the official transcripts, and the letters of recommendation are forwarded to the department; other parts of the application are retained in the Office of Graduate Studies. When the application is complete (an application from an international applicant must include the TOEFL score and financial clearance to be complete), Graduate Admissions clears the applicant for the department's consideration and asks for the department's recommendation.

Notice of Acceptance or Denial

After the admissions file has been reviewed for final acceptance by the department and the Office of Graduate Studies, the university notifies applicants

of the admissions decision. Only a letter from the Office of Graduate Studies grants official university acceptance. International applicants receive an I-20 form or IAP-66 with their acceptance letter; the I-20 and IAP-66 are used to obtain a visa.

Newly admitted international students are required to attend an orientation meeting at the beginning of fall semester. Details are available at the International Student Office (366 SWKT).

Non-degree-seeking Applicants

Students interested in registering at BYU on a non-degree-seeking basis should refer their questions to the University Admissions Office (A-153 ASB).

Registration

B-130 ASB, 378-2824

Eligibility

Upon receipt of an official letter of acceptance from the Office of Graduate Studies, new graduate students are eligible to register. Continuing graduate students are eligible if they have fulfilled the minimum registration requirement (6 hours per year) in the preceding academic year.

Registration Materials

The Class Schedule, containing complete registration forms, instructions, and deadlines, is mailed to all new students with U.S. or Canadian mailing addresses. Continuing students may purchase one at the BYU Bookstore. Class Schedules are not mailed to addresses outside the U.S. or Canada, but international students may obtain a schedule and register when they arrive on campus.

Registration Process

The current Class Schedule contains a complete description of the registration process. What follows is a brief summary of that process:

Brigham Young University allows students to register by Touch-tone telephone or by mail. The process begins when the Registration Office mails an Intent to Register Form to all eligible students. After the form and a \$50 prepayment fee have been received by the university (this prepayment counts

toward tuition, but it is not required for spring or summer term registration), students can register by phone or by mail. The university begins to accept registrations for fall semester in April, for winter semester in October, and for spring and summer terms in January. With the Touch-tone system students can register and make registration changes by phone until a few days before classes begin. Students who do not have access to a Touch-tone phone can register by mailing the Touch-tone work sheet in the Class Schedule to the Registration Office.

A Tuition Billing Statement with a listing of classes is mailed to each student who has completed registration and paid the \$50 prepayment fee. Students who fail to pay tuition by August 15 for fall semester, December 15 for winter semester, and mid-April and mid-June for spring and summer terms will be assessed late tuition fees.

Once a student registers for classes, that student is officially enrolled and committed to attend. A student who then decides not to come must officially withdraw from classes since registration **will remain** on that student's record until formal discontinuance is filed with the Discontinuance Office, (801) 378-7705.

The university reserves the right to close registration when student enrollment reaches the maximum authorized by the board of trustees.

Changes in Registration

Students may add or drop classes twenty-four hours a day by Touch-tone telephone until a few days before classes begin. After the semester or term has started, however, each academic department determines how classes are added in that department. Final dates, fees, and instructions for adding and dropping classes are printed in the current Class Schedule.

Auditing Classes

U.S. students who wish to audit classes (attend but not receive credit) may add such classes on a space-available basis beginning the sixth class period in a semester or the fourth class period in a term. International students may not audit classes. Audited classes do not appear on the transcript, will not fulfill the minimum registration requirement, and do not apply toward a graduate degree.

Registration Requirements

First Semester

Because acceptance is granted for a specific semester, students are required to register for at least 2 hours in the semester for which acceptance has been granted, or the acceptance is forfeit. New students who do not enroll the semester or term for which they are accepted and who wish to enroll in a subsequent semester must inform the Office of Graduate Studies immediately. Acceptance in one semester or term does not guarantee acceptance in a subsequent semester or term.

Minimum Registration Requirement

U.S. Students

Semester or Term. U.S. graduate students are required to register for at least 2 credit hours during any semester or term in which they use any university facilities, consult with faculty, or take comprehensive or oral examinations. The number of graduate credit hours for which they register must, in the judgment of the faculty advisor, accurately reflect the student's involvement in graduate study and use of university resources such as libraries, laboratories, and computer facilities. In no case will the registration be for fewer than 2 credit hours per semester.

Academic Year. To retain active status and to qualify for subsequent registration, graduate students must register for at least 6 semester hours each school year and receive acceptable grades (no D, E, UW, NS, or I grades are allowed; nor are audits or correspondence courses). Students who do not fulfill this yearly requirement are dropped from their graduate programs; they lose their graduate status and must apply for readmission if they wish to continue.

International Students

International students must register for at least 9 semester hours each fall and each winter semester. Questions concerning this requirement and others should be directed to the International Student Office (366 SWKT, 378-2695).

Readmission

Former graduate students who were dropped for failure to meet the minimum registration requirement, and who wish to resume their graduate studies, must submit an Application to Resume Graduate Study (available from the Office of Graduate Studies) and pay a \$30 nonrefundable processing fee. These students should expect their previous course work to be reevaluated and their degree requirements to reflect current expectations of the program.

Loss of Eligibility to Register

Once enrolled, a graduate student becomes ineligible to register for subsequent semesters if:

1. The student has not fulfilled the minimum registration requirement (6 hours per year), has withdrawn from the graduate program, or has had his or her graduate degree program terminated by the department.
2. The student has not submitted a study list by the third week of the second semester after admission.
3. The Office of Graduate Studies has not received official transcripts showing that the required prerequisite degrees have been conferred.
4. The student has violated the BYU Code of Honor and is not cleared by the University Standards Office.
5. The student has failed to submit an annual Continuing Ecclesiastical Endorsement.

Financial Aid Registration Requirements

It is the student's responsibility to comply with any registration requirements established by sponsoring agents for student loans, loan payment deferrals, assistantships, internships, scholarships, and awards.

Graduate Assistants, Interns, and Award Recipients.

Graduate students receiving assistantships, awards, or internships through BYU must register for at least 2 hours per semester or for 1 hour per term. Departmental requirements may exceed these minimums, and international students must register for at least 9 semester hours each fall and winter semester.

BYU Short-Term Loans. Only degree-seeking students enrolled in day school are eligible for short-term BYU tuition loans. Since the amount borrowed is directly applied toward the cost of tuition, no minimum level of enrollment is required.

Federal Loans (Stafford Student Loans and Supplemental Student Loans). To qualify for federal loans, graduate students must normally register for at least 4.5 hours each semester or 2.5 hours each term. However, the regulations require that students who have used their six-month "grace" period but wish to defer payment on a previous federal loan must be registered full-time—8.5 or more hours per semester and 4.5 or more hours per term. Independent study, audit, or workshop classes cannot be used to meet the minimum hour requirement.

Verification of Enrollment Status

Graduate students may request verification of their enrollment status as full-time or part-time students, for loans or for other purposes, from the Records Office (B-150 ASB, 378-2631). Registration for a minimum of 8.5 credit hours constitutes full-time enrollment in a semester, and 4.5 credit hours does so in a term. Registration for fewer hours constitutes part-time enrollment.

Withdrawal or Discontinuance

Students who wish to withdraw from the university must initiate that process at the Discontinuance Support Office, 170 SWKT, 378-7705.

Advisement

Academic Sponsor

Once accepted into a graduate program, students are assigned a department sponsor, usually the department graduate coordinator, who guides their first registration and individual study until an advisory committee is appointed in the *first semester*.

Advisory Committee

During the first semester, students should arrange for the appointment of an advisory committee. Master's (thesis and nonthesis) committees consist of a chair and at least one other member; doctoral

committees have a chair and at least two other members. Departments may require additional members. One member must be from the minor department if a student declares a minor.

Although the chair bears the main responsibility for advising and directing the student, other committee members also assist and advise the student concerning course work, degree requirements, and work on the thesis. It is also important that plans for the thesis, creative project, or dissertation be initiated as early as possible.

Study List

A study list is a carefully considered program that helps students fulfill all degree requirements. It is essential for organized, well-ordered graduate work. The study list should be completed under the direction of the advisory committee during the student's first semester, but in no case later than the third week of the second semester. Students without study lists recorded with the Office of Graduate Studies cannot register for subsequent semesters.

Necessary changes in a student's study list or committee can be made if authorized by the advisory committee and department graduate coordinator.

Progress Reports

Three times a year (before the midpoint of fall and winter semesters and spring term) each graduate student is sent a computer-generated progress report that compares the individual study list with the courses taken and summarizes the student's progress in a program: classes completed, classes still needed, and grade point average. In addition, the progress report alerts a student to possible problems with academic status, GPA, prerequisite degrees needed, minimum registration requirements, time limits, and courses.

Degree Requirements

The following minimum standards for graduate programs have been established by the university, though it is not uncommon for departments to have higher standards. Additional information about specific requirements for each graduate program appears under individual department listings in this catalogue. Furthermore, most departments publish

detailed information about their program requirements that is available from department offices on request. Students should consult frequently with department graduate coordinators and advisory chairs.

Doctor of Philosophy Degree

Admission Requirements. An applicant seeking admission to a program leading to the doctor of philosophy degree must meet the requirements outlined in the Admissions section of this catalogue.

Course Work Requirements

1. **Credit Hours.** The minimum required for students with no master's degree is 54 semester hours beyond the baccalaureate degree; but the 54 hours may not include undergraduate (100 to 400 level) or other courses needed to fulfill prerequisite and skill requirements, or more than 18 hours of dissertation credit. Students who have earned a master's degree must complete at least 36 semester hours of additional graduate course work at BYU beyond the master's degree. So long as these restrictions are met, students may, with the approval of their advisory committee, apply up to 36 hours of a master's program toward a doctoral degree. See the Credit Policies section of this catalogue for information about credits that may not apply toward a graduate degree.
2. **Minor.** To be granted a minor as part of a doctoral degree, a student must:
 - a. Obtain the approval of the department chair of the major and the minor departments.
 - b. Select a graduate faculty member (approved by the department chair of the minor department) to serve as an advisory committee member.
 - c. Register for and complete 12 semester hours of approved graduate credit in the minor.
 - d. Pass an oral or a written comprehensive examination in the minor field (prepared by the minor committee member).
3. **Dissertation Credit.** A student seeking a doctor of philosophy degree must register for and complete a minimum of 18 hours of dissertation credit. No more than 18 hours may count toward the 54 hours required, and the 18 hours may not be lumped together in one term or semester. Reg-

istration for dissertation credit and work on the dissertation must be concurrent.

4. **Foreign Language and Skill Requirement.** At least 18–22 semester hours (may be undergraduate) or their equivalents are required. The Graduate Council has determined that only foreign languages, mathematics, computer science, and statistics meet this requirement (American Sign Language and research methods courses do not). The following options represent minimum expectations:
 - a. *Single language in depth.* Reading and speaking ability are required, usually equivalent to 22 semester hours.
 - b. *Two languages* (reading ability).
 - c. *Combination of one language and one or more skill subjects* (mathematics, computer science, or statistics).
 - d. *Single skill subject in depth or combination of skill subjects* (mathematics, computer science, or statistics).

So long as these minimums are met, the foreign languages and the particular skills required (and the needed level of performance in these skills) are determined by the department and approved by the college and the Graduate Council. Specific requirements are indicated in the department listings of this catalogue. Early in their programs, students should discuss their plans for filling these requirements with their academic advisors and department graduate coordinators. Language or skill courses may not count toward graduate degree credit hour requirements.

Time Limit. A doctoral degree must be completed within eight years of the first semester of enrollment. See the Credit Policies section of this catalogue for more detailed information about outdated credits and the time limit.

Residency. Doctor of philosophy students must register for at least two consecutive 6-hour semesters on the BYU campus.

Comprehensive Examination. Students must pass a written comprehensive examination in their doctoral field under the direction of the major department. The minor department tests in the minor field. This examination is normally given when the

student has completed the required course work for the doctoral degree.

Departments may also require an oral portion of the comprehensive examination. A student is advanced to degree candidacy only after successful completion of the comprehensive examination.

Oral Defense of Dissertation. The final oral examination (defense of the dissertation) must be scheduled with the Office of Graduate Studies *at least two* weeks in advance. Final examinations may not be held during the interim periods between semesters. All members of the BYU academic community are invited to attend the final oral examination, but only appointed members of the examining committee may question the candidate and vote on the candidate's performance.

A copy of the candidate's dissertation must be placed in the Reserve Library (3114 HBL) at least two weeks in advance of the oral examination so that interested faculty and students may review it before the examination.

Examination Committee. A doctoral examination committee must consist of no fewer than five voting graduate faculty members, *at least two of whom are nonadvisory*. Faculty who have served on a candidate's advisory committee earlier in the program, but who have since been replaced, will be considered "nonadvisory" for purposes of the examination if so approved by the department. The chair of the examination committee must be nonadvisory.

Decision of the Examination Committee. The committee may vote to "pass," to "pass with qualification," to "recess," or to "fail" the student. If the decision is to pass with qualification, the committee may require minor revisions of the dissertation, strengthening of the candidate's preparation in subject matter areas, or both. When these qualifications are cleared and the orals committee chair has properly recorded the clearance with the Office of Graduate Studies, the student is judged to have passed the examination. If two or more examiners vote to recess, the examination is recessed. This permits the candidate to reschedule (with the department and the Office of Graduate Studies) a second and final examination. The new examination cannot be held sooner than a month after the recessed examination. In addition, the second examination must be con-

vened with the original examination committee. *If two or more* examiners vote to fail, the examination is failed and the graduate degree program of the student is terminated.

Doctor of Education Degree

Requirements for the doctor of education degree are in many ways the same as for the doctor of philosophy degree described in the preceding section. Differences in the two programs are as follows:

Differences in Admission Requirements. In addition to the requirements included in the Admissions section of this catalogue, an applicant seeking admission to a doctor of education program must either be certified as a teacher or have completed 22 semester hours of approved courses. Further, an applicant must have completed two years of successful professional experience. Prospective students should consult with individual departments for specific requirements.

Differences in Course Work Requirements

1. *Credit Hours.* Most Ed.D. degrees require many more hours than the minimums described.
2. *Dissertation Credit.* A student seeking a doctor of education degree must register for and complete a minimum of 12 hours of dissertation credit. No more than 12 hours may count toward the 54 hours required, and the 12 hours may not be lumped together in one term or semester. Registration for dissertation credit and work on the dissertation must be concurrent.
3. *Foreign Language and Skill Requirement.* Generally no foreign language is required; however, students must demonstrate proficiency in statistics to the satisfaction of the advisory committee. Specific requirements are described in the department listings of this catalogue.

Time Limit. A doctoral degree must be completed within eight years of the first semester of enrollment. See the Credit Policies section of this catalogue for more detailed information about outdated credits and the time limit.

Difference in Residency. Doctor of education students must also register for at least two consecutive 6-hour semesters on the BYU campus. However, in selected programs students may fulfill the residency

requirements by registering for three consecutive full-time summer terms.

Master's Degree

Admission Requirements. An applicant seeking admission to a master's degree program must meet the requirements outlined in the Admissions section of this catalogue.

Course Work Requirements. Advisory committees or program advisors, appointed following admission to a graduate program, will help students prepare their courses of study. The following credit requirements must be met:

1. *Credit Hours.* A student seeking the master's degree must complete a total of at least 30 semester hours of credit (excluding prerequisite courses). See the Credit Policies section of this catalogue for information about credits that may not apply toward a graduate degree.
2. *Minor.* To be granted a minor as part of a master's degree, a student must:
 - a. Obtain the approval of the department chair of the major and the minor departments.
 - b. Select a graduate faculty member (approved by the department chair of the minor department) to serve as an advisory committee member.
 - c. Register for and complete 9 semester hours of approved graduate credit in the minor. No more than 3 hours of 300- and 400-level credit may apply toward the minor.
 - d. Pass an oral or a written comprehensive examination in the minor field (prepared by the minor committee member).
3. *Thesis Credit or Project Credit.* For students in a thesis program, 6 of the required credit hours must be for thesis credit, but no more than 6 hours of thesis credit may count as part of the 30-hour minimum. Registration for thesis credit (from 1 to 6 hours per semester approved by the advisory chair) and work on the thesis must be concurrent. For students in a project program, 2 of the required hours must be for project credit.

Time Limit. Most serious students complete the requirements for the master's degree within three years of the first semester of enrollment. All students, however, must complete the program within

five years of the first semester of enrollment. See the Credit Policies section of this catalogue for more detailed information about outdated credits and the time limit.

Integrated Master's Programs. In a few approved programs, students may earn their baccalaureate and graduate degrees concurrently. Students in such "integrated programs" must pay graduate tuition for at least 20 semester hours or for two full-time semesters.

Oral Defense of Thesis or Selected Projects. The final oral examination (defense of thesis or project) must be scheduled with the Office of Graduate Studies at least two weeks in advance. Final examinations may not be held during the interim periods between semesters. All members of the BYU academic community are invited to attend the final oral examination, but only appointed members of the examining committee may question the candidate and vote on the candidate's performance.

A copy of the candidate's thesis or project must be placed in the Reserve Library (3114 HBLL) at least two weeks in advance of the oral examination so that interested faculty and students may review it before the examination.

Examination Committee. A master's examination committee must consist of no fewer than three voting graduate faculty members, *at least two of whom are nonadvisory*. Faculty who have served on a candidate's advisory committee earlier in the program, but who have since been replaced, will be considered "nonadvisory" for purposes of the examination if so approved by the department. The chair of the examination committee must be nonadvisory.

Decision of the Examination Committee. The committee may vote to "pass," to "pass with qualification," to "recess," or to "fail" the student. If the decision is to pass with qualification, the committee may require minor revisions of the thesis or project, strengthening of the candidate's preparation in subject matter areas, or both. When these qualifications are cleared and the orals committee chair has properly recorded the clearance with the Office of Graduate Studies, the student is judged to have passed the examination. If *two or more* examiners vote to recess, the examination is recessed. This permits the candidate to reschedule (with the department and the

Office of Graduate Studies) a second and final examination. The new examination cannot be held sooner than a month after the recessed examination. In addition, the second examination must be convened with the original examination committee. If two or more examiners vote to fail, the examination is failed and the graduate degree program of the student is terminated.

Credit Policies

Appropriate Credit Enrollment

Because graduate study is more rigorous than undergraduate study, a student should not register for more than 12 hours in a semester or 6 hours in a term. In many programs, even that may be too much. Furthermore, thesis and dissertation credit hours should be spread over the period during which the student is working on the thesis or dissertation. It would be inappropriate, for example, for a student to register for all 18 dissertation credit hours in one semester or term. Students should consult with their advisors in determining an appropriate and reasonable credit enrollment.

Restrictions on Credits That May Apply Toward a Graduate Degree

Non-degree, Senior, and Transfer Credit

Non-degree, senior and transfer credit, singly or combined, cannot exceed 10 semester hours of a graduate degree program.

Non-degree Credit. Credit taken after the baccalaureate degree has been received, but before the semester of formal admission to a graduate program, is defined as nondegree credit. Only with department approval can any such credit be considered as part of a graduate degree program.

Senior Credit. In some restricted instances students seeking a master's degree may apply credit taken during the senior year at BYU toward that degree, but in no instances can this credit apply to both a baccalaureate and a graduate degree.

Transfer Credit. Credit taken at other accredited universities in the United States or in Canada may, with department approval, count toward a graduate degree at BYU if the following conditions are met:

1. Any course to be transferred must be clearly graduate level.
2. The grade for any such course must be B or better (pass/fail courses are not transferable).
3. Home study, correspondence, and extension courses are not transferable.
4. Transfer credit in combination with nondegree and senior credit cannot total more than 10 hours.

Credit from foreign universities can be considered for transfer only if certified by special examination (see the Credits Certified by Special Examination section below for details).

Other BYU Credit

Lower-division courses (100 and 200 level), home study (correspondence) courses, 300- and 400-level religion courses, and education courses numbered 514R *cannot* apply toward a graduate degree. No more than 9 semester hours of BYU undergraduate classes (300 and 400 level) may apply toward a master's degree; and no undergraduate courses may apply toward a doctoral degree (except those already applied to a master's degree).

Credits Certified by Special Examination

In rare circumstances, and with the approval of the department and the graduate dean, up to 10 credits may be certified by special examination. For example,

- a. A student may wish to transfer normally disallowed graduate credit from a nonaccredited institution or from a foreign university.
- b. A student may wish to challenge a course on the study list that covers material already mastered.

Applications to take special examinations may be obtained from the Office of Graduate Studies. For information about special examination fees, see the Tuition and Fees section of this catalogue.

Outdated Credit and Time Limits

Only credit taken within the time limit for each degree may count toward the degree (eight years from semester or term of admission for doctoral degrees, except six years for doctoral degrees in the

College of Education, and five years for master's degrees). Petitions to extend time limits and count outdated credit are governed by the following:

1. Departments and colleges may petition for up to a one-year extension by providing reasonable evidence that extenuating circumstances caused an unavoidable delay in the student's progress toward a degree.
2. Departments and colleges may petition to allow credit outdated by more than one year but no more than five years to apply toward a degree, but the petition must be accompanied by impressive documentation that the credit in question has been updated by courses retaken, by special readings courses in the subjects outdated, or by examinations in each of the courses.
3. No credit outdated by more than five years may apply to a current degree, regardless of circumstances.

Academic Standards

Grade Point Average (GPA) Requirements

Although a C is an acceptable grade in strong, competitive graduate programs, graduate students whose graduate program (study list) GPA falls below 3.0 (prerequisite and skill courses are exempted) will not be allowed to graduate and may be dismissed from their graduate programs. Students whose grades frequently fall in the C range or below should consult with their committees about the advisability of continuing graduate study. No D credit may apply toward a graduate degree.

Annual Reviews of Graduate Students

Departments are asked to evaluate the performance of graduate students *at least once a year*; some evaluate more frequently. Students granted provisional admission should expect a review as early as the end of the first semester.

Each department establishes its own evaluation criteria and the standards it requires of graduate students, but generally students can expect to be evaluated on their total academic performance, their fulfillment of program requirements (study list submitted, courses completed on schedule, prospectus approved by department, student advanced to candidacy), and their professional performance (includ-

ing quality of teaching and research). Copies of departmental evaluation criteria are available in individual departments.

Departments rate student performance as Satisfactory, Marginal, or Unsatisfactory, indicating the reasons for a low rating, and inviting the student to respond to the evaluation or to comply with a set of stated conditions for remaining in the program.

Termination of Graduate Status

Termination of graduate status may result if a student:

1. Fails to fulfill the university's minimum registration requirement.
2. Makes a request to withdraw (with the intent to pursue a degree at another university, for personal reasons, or in response to department recommendation).
3. Receives a Marginal or Unsatisfactory rating in a periodic review by the academic department and is unable or unwilling to comply with conditions for continuance outlined by the department.
4. Fails to make what the department or the university deems to be satisfactory progress toward a graduate degree.
5. Fails the departmental comprehensive examination.
6. Fails the final oral examination (defense of dissertation, thesis, or project).
7. Violates the university's standards of conduct or Honor Code.

Appeal of Termination. A student dismissed or facing dismissal for reasons other than failure of a comprehensive examination or a final oral examination may respond to or appeal that termination or impending termination. Such responses or appeals should be directed, in writing, to the department chair or graduate coordinator. A student who wishes to appeal further may seek an audience with the college dean or associate dean. Ultimately, a final appeal may be made to the university graduate dean who, if circumstances warrant it, may appoint a committee of disinterested faculty members to adjudicate the matter.

Student Academic Grievances

The university has an established procedure for handling student academic grievances. If consulting with the teacher or the graduate advisory chair does not resolve a grievance, a graduate student should describe the problem to the department graduate coordinator and/or the department chair. If difficulties persist, the student may ask the college dean and finally the graduate dean for assistance.

Records

Office of Graduate Studies

B-356 ASB, 378-4091

The Office of Graduate Studies maintains student records pertinent to graduate study at BYU, including original applications, approved study lists, and official transcripts received from other universities.

Records Office

B-150 ASB, 378-2631

The Records Office maintains permanent records of all academic work done at the university. The office is also responsible for issuing official transcripts of credit, which include only courses completed through BYU.

Repeating Classes

Some graduate programs do not allow students to repeat required graduate courses. Those that do are governed by the following policies:

1. Brigham Young University courses may be repeated unless such courses carry an R suffix (see discussion of R suffix below).
2. Courses taken at another university may be repeated at Brigham Young University, but the appropriate BYU department chair must supply a statement of equivalency.
3. Courses taken at another institution may be repeated there and the credit transferred to Brigham Young University. Students wishing to transfer credit to BYU should consult the Credit Policies section of this catalogue because not all transfer courses may count toward a graduate degree.

Note: A course repeated at an institution other than the one at which it was taken originally, and other than at BYU, will not be counted as a repeated course.

When a class is repeated, only the last grade earned counts; the grade point average is computed using the grade and credit hours earned the last time the repeated class was taken.

"R" courses are treated differently. Since an R course is one that may be repeated for credit, it is assumed that the subject matter varies from semester to semester in such a course. Therefore, when an R course is repeated, both grades count; the grade point average is computed using the grades and credit of both classes.

Transcript Record Holds

A hold is placed on the record of a student who fails to meet university obligations (fees outstanding, university standards violations, traffic tickets, library fines, etc.). No copy of the transcript or information pertaining to it will be released until the obligation is fulfilled.

Confidentiality of Records Policy

The policy of Brigham Young University concerning confidentiality of student academic records reflects a reasonable balance between the obligation of the university for the instruction and welfare of the student and the university's responsibility to society. The university makes every effort to maintain student academic records in confidence by withholding information from individuals who are not authorized to receive it. Faculty and administrative officers who have a legitimate need to use students' records will be allowed access to such records as needed without prior permission from the student. The Confidentiality of Records Policy is detailed in the University Handbook and the BYU General Catalogue.

Financial Assistance

Graduate Awards

BYU offers four types of graduate awards, all through individual departments—assistantships, internships, private scholarships, and supplementary awards. Because teaching and research are vital

components of graduate programs, most graduate awards given by Brigham Young University are in the form of teaching and research assistantships and internships. Supplementary awards are grants that may be used only for the payment of fees.

Application. New students may apply for graduate awards as part of the regular admission process. Continuing students can obtain information and applications from their departments.

Requirements and Selection. To be eligible for assistantships, internships, or supplementary awards, students must be degree-seeking graduate students in good standing who are registered for at least 2 credit hours in the semester (or 1 credit hour in the term) for which the award is granted. The awards are competitive and generally go to students whose academic performance indicates real merit. All selections are made by academic departments.

Student Loans

Ford L. Stevenson, Director of Student Financial Aid
A-41 ASB, 378-4104

Two types of student loans are available to graduate students who qualify—BYU need-based loans (short-term, Law School, and Graduate School of Management) and federal loans (the Stafford, the SLS, and the PLUS). Only degree-seeking students who are making satisfactory academic progress will be considered for loan approval.

Application. Application materials and information about eligibility and repayment requirements are available in the Financial Aid Office.

Deadlines. Students must submit applications for any BYU need-based loans or federal loans by the following deadlines: 1 March 1991 for fall 1991; 1 November 1991 for winter 1992; 1 March 1992 for spring 1992; 1 May 1992 for summer 1992.

Student Employment

C-40 ASB, 378-3561

Most student campus jobs other than assistantships and internships are listed in the Student Employment Office. Certain federal restrictions apply to students from foreign countries.

Graduation Policies and Instructions

All Graduate Students

Final Semester Registration. Before applying for graduation, a graduate student should have completed all course work on his or her approved study list or be currently registered for the remaining requirements. During the final semester, or the semester of final oral and written examinations, a graduate student must either register or pay an equivalent registration fee to the Office of Graduate Studies for at least 2 semester hours of credit. Audit and correspondence credits do not count.

Application for Graduation. Graduate students should apply for graduation by the deadlines listed below. Applications received after these deadlines will be processed for the next graduation. To apply for graduation, all students—in thesis or nonthesis programs—must submit a Graduation Application through their departments and pay the graduation fee to the Cashiers' Office.

After the department has completed its preliminary check and given its approval, the application is sent to the Office of Graduate Studies for a final check. Students will be notified of the results of this evaluation and informed of any problems that need attention.

Graduation Fees

Doctoral candidates	\$25
Master's candidates	\$20
TESL certificate applicants	\$20
Psychological specialists	\$20

1991-92 Graduation Deadlines

See the University Graduate Studies Calendar in this catalogue for graduation deadlines.

General Caution. The graduation deadlines are firm. Students submitting materials after the deadlines will be candidates for the *next* graduation.

Students in Dissertation, Thesis, and Selected Project Programs

Students in selected project programs must meet the same requirements as students in dissertation and thesis programs with regard to the scheduling of the

final oral defense, the composition of the examination committee, and the standards and format of the major written work. The following departments offer selected project programs: Agronomy and Horticulture, Industrial Education, Nursing, Physical Education, Psychology, Technology, Theatre and Film, and Zoology.

Format Requirements. Colleges and departments, not the Office of Graduate Studies, are responsible for both the content and the format of dissertations, theses, and selected projects. These works are expected to meet the highest standards of excellence in substance and in appearance. The Graduate Council, in its review of graduate programs, and the graduate dean select dissertations, theses, and projects for reading and review.

Requirements regarding the number of copies to be submitted and the format of such items as the title page, the acceptance page, and the abstract page are stated in "Guidelines for Meeting Minimum Standards," available from either the department or the Office of Graduate Studies.

Scheduling the Oral Defense. All students in thesis, dissertation, or selected project programs must schedule the final oral examination *at least two weeks* in advance. Final examinations may not be held during the interim periods between semesters.

Copy of Work Placed in Library. All members of the BYU academic community are invited to attend the final defenses of dissertations and theses. Therefore, all students in dissertation, thesis, or selected project programs are required to place a copy of their work in the Reserve Library (3114 HBLL) at the time the final oral examination is scheduled (two weeks in advance) to enable interested faculty and students to review it before the examination.

Final Copies. Ample time should be allowed for making corrections to the work after the final oral

defense and before the deadline for submitting final copies to the library (March 15 for April 1991; July 12 for August 1991; December 6 for December 1991; March 13 for April 1992; and July 10 for August 1992).

Commencement and Convocation

All candidates for graduation are encouraged to participate in the university's commencement and convocation exercises in either April or August (students completing degrees in December are invited to participate in the following April commencement activities). Doctoral candidates are hooded in the commencement exercises; master's candidates are recognized in their respective college convocation exercises.

Honor Designations

No honor designations are given upon conferral of advanced degrees. Various honor societies, however, may nominate graduate students for membership.

Diplomas and Transcripts

Diplomas are mailed to graduates from eight to twelve weeks after graduation. Receipt of the degree is recorded on the student's official transcript within one month after graduation, and a complimentary copy of the transcript is mailed with the diploma.

Letter of Completion

After a graduate student has completed all the requirements for graduation, the Office of Graduate Studies can furnish a letter of completion if the student requests it. This document certifies that the student has satisfied all the requirements for the degree and confirms that the degree will be conferred.

College of Biology and Agriculture

Dean: Clayton S. Huber, Professor, Food Science and Nutrition, 301 WIDB

Associate Dean, Graduate Studies: Richard W. Heninger Professor, Zoology, 302-B WIDB

Associate Dean: William L. Park, Professor, Economics, 302-C WIDB

The departments in the College of Biology and Agriculture offer the following graduate degrees:

Agronomy and Horticulture

Agronomy M.S.

Horticulture M.S.

Animal Science

Animal Science M.S.

Botany and Range Science

Botany M.S. and Ph.D.

Genetics M.S. and Ph.D.

Range Science M.S.

Food Science and Nutrition

Food Science and Nutrition M.S.

Food Science M.S.

Nutrition M.S.

Microbiology

Medical Technology M.S.

Microbiology M.S. and Ph. D.

Zoology

Entomology M.S. and Ph.D.

Zoology M.S. and Ph.D.

The College of Biology and Agriculture also offers the following interdisciplinary programs:

Biological Science Education: These graduate programs are offered through the Departments of Botany and Range Science, Microbiology, and Zoology.

Agricultural and Natural Resource Development: Students interested in agricultural and natural resource development in the less developed countries of the world can pursue specialized M.S. degrees in this field of study in all departments within the college. See departmental advisor for specific program requirements.

Molecular Biology: Students can specialize in the application of molecular biology to all discipline programs in the college. See respective department for detailed requirements.

Wildlife and Range Resources: Graduate degrees in this field of study are offered by the Departments of Botany and Range Science and Zoology.

Research Facilities

The College of Biology and Agriculture is actively engaged in research and has several special facilities and programs of particular interest to graduate students.

BYU Agriculture Station

Director: Max V. Wallentine, 392 WIDB

The station encompasses several sites, all of which support research in basic and applied agriculture. Station facilities

include an 837-acre farm with 80 acres of orchards, crop research plots, a 400-cow dairy, a 60-head beef herd, and a 60-sow swine unit in Spanish Fork, Utah, a few miles south of Provo; the 7,800-acre BYU Skaggs Research Ranch near Malta, Idaho; and several livestock project areas in north Provo, among them the Ellsworth Meat and Livestock Center and poultry, sheep, and horse projects. At these facilities, research can be conducted on physiology and reproduction, health, and nutrition of several species, including beef and dairy cattle, sheep, horses, swine, goats, rabbits, guinea pigs, chickens, and turkeys.

Ezra Taft Benson Agriculture and Food Institute

Director: James B. Jensen, 110 B-49

The major objective of the institute is to raise the quality of life among the people of the world through improved nutrition and enlightened agricultural practices. Emphasis is placed on teaching and training students who wish to work in foreign countries and on training people from those countries in agriculture and food science practices that can be used to make a difference in improving life. Research to improve agricultural practices, family nutrition, and appropriate technology is encouraged.

M. L. Bean Life Science Museum

Director: Stanley L. Welsh, 290 MLBM

Exhibits and collections of biological specimens are housed in the M. L. Bean Life Science Museum. The exhibits include habitat studies of local as well as exotic plant and animal species and a large and valuable collection of trophies from North America, Africa, and Asia.

Tours and Educational Programs. The museum offers a broad range of educational opportunities for students, from specialized graduate research in the various systematic collections housed in the museum to impromptu tours for the casual visitor. Many university classes make arrangements to utilize the extensive holdings. The museum also serves the community by providing educational opportunities for elementary and secondary schools as well as civic groups.

The Botanical Collection includes herbaria of vascular plants, mosses, liverworts, lichens, algae, and fungi from many parts of the world. The vascular plant collection includes more than 10,000 species represented by more than 325,000 herbarium sheets. The collection is made up principally of plants from western North America but includes many materials from the eastern United States, Europe, Mexico, and Australia. Acquisitions of plants from Alaska, Greenland, Siberia, and the Canadian Arctic have added significantly to the collections of Arctic plants. Lichens and mosses number about 8,000.

The herbarium includes more than 2,000 specimens from the Mediterranean region of Europe and from the Middle Eastern countries of Iran and Afghanistan. The fossil plant collections contain more than 10,000 specimens.

The **Zoological Collections** consist of a large series of vertebrate and invertebrate species from North America and from many foreign countries. These materials are available for study by teachers, advanced students, and visiting scientists.

The invertebrate collections include insects and their near relatives as well as other phyla of invertebrates obtained locally and from more distant places. The collections also represent medically important arthropods such as fleas, lice, mites, and ticks. Collections of special interest include marine shells and more than one million insects (with particular emphasis on butterflies, flies, and beetles.) Collections also represent other invertebrate groups.

The vertebrate collections consist of thousands of fish, amphibian, reptile, bird, and mammal research specimens. In addition to the representative series of local species, the vertebrate collections include South and Central American birds, birds' eggs, and Hawaiian fishes. Staff members, graduate students, and friends of the university have contributed material from Mexico, South America, Africa, Taiwan, Malaya, the South Pacific islands, and other areas throughout the world. The vertebrate collections also include big game trophy collections from Africa, India, and North America.

Electron Optics Laboratory

Director: Wilford M. Hess, A-140 CLFB

In the electron optics laboratory researchers can accomplish all standard electron optics procedures. The laboratory has transmission and scanning electron microscopes equipped with X-ray microanalysis capabilities, plus accessory equipment for freeze-fracture, freeze-drying, and necessary support facilities, including confocal laser scan microscopy.

USDA Forest Service Shrub Science Laboratory

Project Leader: Durrant MacArthur

Housed on the BYU campus, this laboratory supports one of the finest research programs on native shrubs in the world. Here eleven Ph.D. research scientists with adjunct faculty appointments work with BYU faculty members and graduate students. Laboratories, greenhouses, and gardens on campus and around the state support studies on desert shrubs.

Dairy Products Laboratory

Researchers in the Dairy Products Laboratory conduct research dealing with milk and dairy products, using full- and pilot-scale equipment.

Sensory Laboratory

The sensory laboratory is a modern taste panel facility featuring isolation booths, positive pressure in the booth area, and controlled lighting. Preference and difference testing is conducted using consumers and trained panelists. The sensory laboratory also has facilities for descriptive analysis.

Western Dairy Foods Research Center

Under a five-year agreement, Brigham Young University is affiliated with Utah State University and Oregon State University in the Western Dairy Foods Research Center. As

one of six such centers nationwide, this center is dedicated to cheese and cultured product research.

Lytle Ranch Preserve

Graduate students are able to do year-round on-site research and study of desert plants and animals at this large preserve in the moderate desert climate of southwestern Utah.

Miscellaneous Campus Facilities

On the Provo campus are greenhouses, gardens, an arboretum, a small animal vivarium, and a tissue culture room. Laboratory facilities include gas chromatography-mass spectrometers, isotope ratio mass spectrometers, transmission and scanning electron microscopes, ultra centrifuges, visible ultraviolet and infrared spectrophotometers, gas chromatographs, high-performance liquid chromatographs, infrared gas analyzers, atomic absorption spectroscopy, and many other items.

Research Projects

Faculty and graduate students are currently engaged in a number of significant and interesting research projects, funded both externally and internally. Some of these are:

1. **Iron Uptake by Plants.** Because some plants have an efficient iron-transport system at the root surface that is controlled by a single gene, researchers postulate that a logical solution to the worldwide problem of iron-deficiency anemia may be to increase the iron content of certain foodstuffs.
2. **Shrub Genetics, Ecology, and Physiology.** Researchers are investigating the differences in photosynthetic and growth rate, plus water-use efficiency in various shrubs, partly to determine their value as browse for cattle and wildlife.
3. **Biochemical Ecology.** Scientists are studying the complex plant-herbivore interactions between host plants and insects such as the Western Pine Beetle and the Spruce Bud-worm.
4. **Photosynthetic Rate and Water-Use Efficiency in Plants.** Efforts to increase the value of plants as browse for cattle and wildlife, to assist in revegetation of disturbed lands, and to increase efficiency of food production are in progress.
5. **Plant Growth Regulators.** Research is being conducted on both basic and applied aspects of chemical plant growth regulation. The focus of the applied research is on the potential uses of plant growth retardants on floricultural crops, turf grass, and woody ornamentals. Cross-commodity projects dealing with the uses of growth regulators for propagating and controlling postharvest quality of horticultural crops are also in progress. The basic research deals with the effects of plant growth regulators on senescence, stress physiology, and photosynthesis.
6. **Forage Research.** At the agriculture station, cooperating agronomists and animal scientists are conducting studies on fertility and plant density levels, harvested dry matter levels of silages, and the influence of that matter on field yields, nutrient content, and animal production. A ten-year

- multidepartmental palatable shrub production and grazing study in cooperation with the USDA Forest Shrub Laboratory is observing the culture and production parameters of exotic shrub species for potential livestock and game grazing.
7. **Economics in Agriculture.** Research is conducted on natural resources issues, dairy economics, and the structure of agriculture.
 8. **Molecular Biology of Gene Expression in Mitochondria.** Projects include regulation of mitochondrial gene expression (1) in brown adipose tissue mitochondria as dietary components affect long-term regulation of thermogenesis, and (2) alteration in mitochondrial genes that affect energy expenditure, resulting in inherited obesity or thinness.
 9. **Virology and Molecular Biology.** Projects include study of the genome of Aleutian Disease Virus, which will include eventually sequencing the entire genome; study of the adeno-associated virus type 2, which requires a helper virus to reproduce itself; and a study of certain soil microorganisms to assess the genetic mobility of plasmids in a naturally occurring population. Additional genetic studies utilizing DNA recombination and mutagenesis techniques are being carried out with cyanobacteria. The passage of the genetic material from these bacteria to plants may be of particular significance in agriculture since the cyanobacteria are capable of utilizing gaseous nitrogen and carrying out photosynthesis.
 10. **Antiviral Drug Research.** Ribavirin and some other carboxamides are effective in blocking viral replication of many human and animal viruses, thus significantly altering the course of infections. The antiviral mechanism(s) of these drugs is being studied, utilizing a variety of RNA viruses that use widely different strategies to express their viral genomic information during their replicative cycles.
 11. **Cancer Research.** A variety of human cancer cells, but not normal cells, are killed by the exposure to platelets in tissue culture. Experimentation is under way on the isolation and characterization of the platelet factors that may have therapeutic significance in cancer treatment.
 12. **Vertebrate Evolution, Genetics, and Distribution.** Research has focused on evolution in Sceloporine lizards in the southwestern United States and Mexico, documented with karyological, electrophoretic, and mitochondrial DNA techniques. Studies on groups as diverse as chipmunks, rattlesnakes, and fishes are also included. Also under study are the diversity, distribution, behavior, and management of both small nongame and big-game mammals.
 13. **Evolutionary Genetics and Zoogeography of Insects.** Using recombinant DNA techniques, *in situ* hybridization, and the genus *Drosophila* as a starting point, studies pursue the evolution of karyotypes and genome structure. Studies of island mountain biogeography and the aquatic insect fauna of Mexico give us clues as to how faunas have moved between North and South America.
 14. **Marine and Freshwater Biology.** Research is performed at both Stanford University's Hopkins Marine Station and the University of Washington's Friday Harbor Laboratories. It involves SCUBA collection of field data and also laboratory analysis of sublittoral community competition for space, as well as feeding and offensive and defensive strategies of marine populations. Examples of freshwater research include community energetics and succession in lentic ecosystems, the role of physical perturbations (e.g., avalanches) on stream community structure, the systematics and evolution of native trout, and the use of cytogenetics to identify intergenera hybrid swarms.
 15. **Sexual Differentiation of the Brain.** Various morphological, biochemical, and behavioral techniques are being used to elucidate the mechanisms regulating sexual differentiation of the brain. The mammalian brain appears to be inherently female, or at least undifferentiated. Functional and morphological characteristics of the brain that are typical of the male sex develop in response to the action of testicular hormones on the development and differentiation of the basically female brain. An understanding of the mechanisms regulating the sexual differentiation processes has profound implications for reproductive biology, animal behavior, and developmental neurobiology.
 16. **The Physiology and Biochemistry of Exercise.** Researchers are examining in detail the effect of training on retention and use of glycogen and fat reserves in rats.
 17. **Mineral and Trace Minerals Nutrition.** A variety of research projects are studying the importance of minerals and trace minerals in human nutrition, e.g., magnesium intake during pregnancy, magnesium and auditory brain stem responses, and selenium and platelet aggregation.
 18. **International Nutrition.** The major research interest is establishing the role of nutrition in human development. This involves identifying the constraints of adequate nutrition and the consequences of malnutrition in Third World countries. Linkages between nutrient deficiencies and physical stunting and/or delayed mental development are examined, and effective and appropriate assistance models are designed.
 19. **Lipid Oxidation.** Basic food lipid research is being conducted with an emphasis on lipid oxidation. Studies include oxidative stability and sensory evaluation of fractionated food lipids and optimization of processing and storage conditions to extend the shelf life of foods.
 20. **Continuous Process for Cottage Cheese.** Continuous processes have been developed for cottage cheese production, but textural problems have limited their application. Research projects funded by the Western Dairy Foods Research Center have been initiated that will help resolve this problem.
 21. **Clinical Laboratory Methods.** Improved procedures for the laboratory diagnosis of defects in iron, calcium, steroid, and lipid metabolism as well as hemoglobin formation and kidney function are being researched.

22. **Biological Science Education.** The master of biological science education involves the development and field testing of laboratory activities for use by high school biology students as well as the development of student laboratory manuals, work sheets, and comprehensive teachers' guides.
23. **Sex Determination of Dairy Cattle Embryos.** Use of molecular biology techniques to determine the sex of dairy cattle embryos. The findings of this research are to be integrated into the embryo transfer program now in place at the BYU Dairy.
24. **Effect of Nutrient Intake on Gene Expression.** Research explores in detail the structure and organization of the gene encoding the selenoprotein glutathione peroxidase, the mechanism of its regulation, and the dependence of that regulation on dietary intake and availability of the essential trace element selenium.
25. **Environmental Science.** Research is being conducted into the various ways humans are affecting the earth's ecosystems, including studies upon the effects of air, water, and land pollution. Plant and animal interactions and destruction and preservation of natural habitats, interference with nutrient cycling and energy flow and simplification of ecosystems are also being studied.
26. **Structural Plant Science.** Research in this area includes various aspects of plant anatomy, plant morphology, and ultrastructure of biological systems. Investigators also conduct ethnobotanical, paleobotanical, and taxonomic studies.

Study Facilities

Departments in the college provide study areas and/or space in research laboratories for graduate students.

College of Education

Dean: Dan W. Andersen, Professor, Educational Leadership, 343 MCKB

Associate Dean: Ruel A. Allred, Professor, Elementary Education, 343 MCKB

Associate Dean: Russell T. Osguthorpe, Professor, Instructional Science, 343 MCKB

The departments in the College of Education offer the following graduate degrees:

Educational Leadership

Educational Leadership M.Ed.

Educational Leadership Ed.D.

Educational Leadership Ph.D.

Educational Psychology

Educational Psychology M.S.

Educational Psychology M.Ed.

Audiology M.S.

Speech-Language Pathology M.S.

Counseling Psychology Ph.D.

Elementary Education

Reading Ed.D.

Teaching and Learning M.A. and M.Ed.

Instructional Science

Instructional Psychology Ph.D.

Instructional Science M.S. and Ph.D.

Graduate study in the College of Education has two central purposes: (1) researching educational processes and issues; and (2) enhancing the preparation of master teachers, principals, counselors, school psychologists, clinical audiologists, and other professionals in education.

The goal of the College of Education is "to develop professional educators who affect both theory and practice in their field and who provide leadership that results in beneficial and significant changes." Undergirding graduate study and the preparation of professional educators is

research. The general focus of research is directed by the mission of the college.

Special Facilities

Computer Laboratory with Access to VAX

Computer terminals in the laboratory provide graduate students direct line access to the university's large main-frame computers, enabling students to use several sophisticated programs, such as SPSS and SAS, to analyze research data. These terminals also enable students to search out books in the Harold B. Lee Library.

Graduate Student Project and Research Laboratory

Laboratory space is provided for graduate students who are working with faculty on research, evaluation, and development projects.

Educational Psychology Center

This center affords students an opportunity to learn and practice a variety of applications for the principles and theories they study in their course work. Through practical applications students gain valuable experience in diagnosing learning and achievement difficulties; remediating learning and behavioral problems; consulting with parents, teachers, and other professionals regarding strategies for helping the center's clients; counseling individuals with a variety of academic, vocational, and personal problems; and giving career assessment and guidance to young people and adults.

Study Areas

Graduate study areas are available in the Project and Research Laboratory, the Science Education Laboratory, and the Learning Resource Center.

College of Engineering and Technology

Dean: L. Douglas Smoot, Professor, Chemical Engineering, 270 CB

Associate Dean, Graduate Studies: S. Olani Durrant, Associate Professor, Civil Engineering, 270 CB

Associate Dean, Research: Steven E. Benzley, Professor, Civil Engineering, 270 CB

Associate Dean, External Relations: E. Max Raisor, Professor, Mechanical Engineering, 280 CB

The departments in the College of Engineering and Technology offer the following graduate degrees:

Chemical Engineering

Chemical Engineering M.S.
Engineering Ph.D.

Civil Engineering

Civil Engineering M.S.
Engineering Ph.D.

Electrical and Computer Engineering

Electrical Engineering M.S.
Engineering Ph.D.

Industrial Education

Industrial Education M.S.

Mechanical Engineering

Mechanical Engineering M.S.
Engineering Ph.D.

Manufacturing Engineering and Engineering Technology

Computer-Integrated Manufacturing M.S.
CIM—Industrial M.S.

In addition, the College of Engineering and Technology offers master of engineering management and master of technology management degrees.

Detailed descriptions of these degree programs appear in the engineering and industrial education department sections. BYU undergraduate students may begin graduate study before obtaining their baccalaureate degree through enrollment in the integrated master's program.

The departments offer financial aid in the form of scholarships and internships. In addition, research programs fund assistantships and research associates. For more information about these awards, consult individual departments.

Research Centers, Laboratories, and Other Facilities

The College of Engineering and Technology has experienced rapid growth in funded research during the past decade. In recent years the college research budget has had an average annual growth of more than 30 percent; the budget for the 1989-90 fiscal year exceeded \$6 million. A national leader in several areas, college research organizations now have two centers, including one of the prestigious National Science Foundation engineering research centers, five research laboratories, and three state-funded centers of excellence. More than half the faculty participate in research endeavors, and a number have gained international recognition for their work. The college presently

enrolls nearly 300 graduate students, some 70 of whom are in doctoral programs.

Advanced Combustion Engineering Research Center (ACERC)

Nationally recognized as a leading center for interdisciplinary combustion research, BYU was recently identified by the National Science Foundation (NSF) as the site for one of only 13 NSF-sponsored engineering research centers. Selected from among more than 100 applicants, this center has secured significant additional financial support from U.S. corporations. The center is under the direction of L. Douglas Smoot, dean of the college. Students and faculty associated with the center pursue experimentation, analysis, computer modeling, and design of combustion systems. The center is designated as a state center of excellence and as such has received additional financial support from the state of Utah.

ACERC funds several research assistantships for graduate students and research associates each year. Current key areas of research emphasis include: (1) fuels structure and their reaction rates; (2) behavior of fuel minerals; (3) formation and control of pollutants; (4) turbulence and its interactions with chemical reactions; (5) comprehensive modeling of combustion systems; and (6) combustion process characteristics.

CAM (Computer-aided Manufacturing) Software Research Center (CSRC)

Begun as a laboratory in 1975 by Dell K. Allen, Kay F. Brown, and Wilford J. Tolman, the CSRC was established to fulfill a national need for improved methods to integrate design and manufacturing and to enhance quality and productivity. Significant developments over the years have included design of integrated manufacturing architecture models, the CIM data base, a universal machine control system, the DCLASS rule-based expert system, and an extensive set of training modules containing the manufacturing knowledge base.

CSRC has been identified as a state center of excellence in computer-integrated manufacturing. Under this program, CSRC is working closely with industry to transfer research into applications. Present research is focused on the creation of a CIM factory design system that will incorporate strategic, business, and marketing plans into the factory design process. A three-level factory architecture model has been defined that incorporates management, technical support, and factory operations. Group technology, modeling, analysis and simulation, just-in-time strategies, relational data base technology, and real-time shop floor concepts are incorporated in the overall design philosophy.

Catalysis Laboratory

Headed by Calvin Bartholomew, the BYU Catalysis Laboratory has a 14-year history of productive research in heterogeneous catalysis. This research is highly interdisciplinary in nature as it applies principles of kinetics, chemistry, materials science, surface science, and chemical

engineering to the understanding of catalyst properties and catalytic reactions.

The Catalysis Laboratory is housed in the Chemical Engineering Department. Its principal objectives are to: (1) obtain a basic understanding of catalyst functions and their relationships to catalyst structure in energy and air pollution-related processes; (2) develop new methods and tools for catalyst study; and (3) train and educate students in the science and art of catalysis research. Present research efforts are focused on basic research in catalytic adsorption, supported metal catalysis, catalyst preparation, catalyst characterization, coal characterization and oxidation, and catalyst deactivation.

Combustion Laboratory

Organized in 1977 to bring together faculty who shared common research interests, the Combustion Laboratory maintains one of the most active and extensive combustion programs in the United States. This laboratory provided the basis for the creation of ACERC, and it continues to function as an important part of that organization. Research activities are broad and well funded and presently include coal combustion, pollutant formation, coal gasification, turbulent mixing, dust explosions, and the modeling of gaseous and particle-laden combustion processes. Direction is given to the Combustion Laboratory by Dean Smoot as part of his activities with ACERC.

Engineering Computer Graphics Laboratory (ECGL)

This laboratory was formalized in 1985 following a decade of research and development in computer graphics under the leadership of Henry N. Christiansen of the Civil Engineering Department. During that period the faculty and graduate students associated with the lab have created computer graphics and structural analysis software that has been distributed worldwide.

The laboratory maintains a sizeable array of hardware that equips the comprehensive computer graphics research facility. Laboratory objectives include the promotion of an atmosphere of academic research related to computer-aided engineering and the development of procedures and computer codes, with special emphasis on computer graphics.

Engineering Design Methods Laboratory (EDML)

EDML was formed by an interdisciplinary group of faculty and graduate students whose common interest is the development of strategies, software tools, and understanding for increased productivity in engineering design. EDML is housed in the Mechanical Engineering Department under the direction of Alan R. Parkinson. Researchers associated with the laboratory emphasize the study of generalized methods to attack a wide range of design problems. Included among these are strategies for designing complex systems, software systems for engineering design, design/manufacturing interfaces, shape optimization in design, and modeling of systems for design. The laboratory has developed OPTDES.BYU, a software system that brings constrained optimization algorithms and analysis software together so that the design engineer

can quickly explore highly dimensional design space, focus on synthesis rather than analysis, and achieve optimum designs.

Integrated Systems Laboratory (ISL)

The Integrated Systems Laboratory was created in the Technology Department for researching integrated, interdisciplinary solutions to complex implementation problems in design and manufacturing systems. Hardware and software issues related to systems automation and management strategies coupled with human factors and socioeconomic considerations are the primary focus of work done in this laboratory. Industrial support from various leading CAD/CAM/CIM systems vendors has provided ISL with an elaborate hardware and software platform. Correlated industrial research and development contracts have produced a spectrum of applications challenges that allow graduate students direct involvement in integration problem solutions.

Digital Signal Processing

During the past decade two professors of electrical engineering, Douglas M. Chabries and Richard W. Christiansen, have developed a comprehensive digital signal processing research program. In 1986 the state of Utah designated the program a center of excellence. This research effort includes image processing, particularly directed toward advancing techniques for transmitting compressed digital images; speech processing with application to digital signal processing in hearing aids, robotics, speech synthesis and analysis; and the design and development of design tools for VLSI.

Facilities include extensive computer resources, signal processing software tools, image display and digitizing equipment, and a sound room. All computer systems are interfaced through several parallel networks, thus permitting researchers to bring the latest capabilities to bear in their work.

Facilities

Research facilities in the College of Engineering and Technology are broad and sophisticated. Each of the previously identified centers and laboratories is well equipped with the latest research implements. In addition to equipment procured or fabricated to fulfill research obligations, industrial partners over the past half-dozen years have contributed equipment valued at some \$20 million. This has created an environment that has fostered increased research endeavors and provided students with access to the very latest hardware. Generous laboratory and office space provides graduate students with an ideal environment in which to pursue their scholarly efforts. Close cooperation with industry and governmental agencies has assured that the research activities are on the forefront of national needs, and BYU engineering researchers have gained a reputation for producing ideas, strategies, and software that have immediate application.

Information regarding other research efforts not described in this section may be found in the various departmental publications.

College of Family, Home, and Social Sciences

Dean: Donovan E. Fleming, Professor, Psychology, 990 SWKT

Associate Dean, Graduate Studies and Curriculum:

James M. Harper, Associate Professor, Family Sciences, 980A SWKT

The College of Family, Home, and Social Sciences offers an extensive network of graduate programs that prepare students for academic, clinical, and field research and practice.

The departments in the College of Family, Home, and Social Sciences offer the following graduate degrees:

Anthropology

Anthropology M.A.

Clothing and Textiles

Economics

Applied Economics M.S.

Family Sciences

Family Sciences M.S. and Ph.D.

Family Studies Ph.D.

Marriage and Family Therapy M.S. and Ph.D.

Geography

Cartography M.S.

Geography M.S.

Planning M.S.

History

History M.A. and Ph.D.

Political Science

Psychology

Clinical Psychology Ph.D.

Psychology M.S. and Ph.D.

School Psychology S.P.C. Certificate

Social Work

Social Work M.S.W.

Sociology

Family Studies Ph.D.

Sociology M.S. and Ph.D.

Interdisciplinary Program

The College of Family, Home, and Social Sciences has an interdisciplinary program in international and area studies (M.A.) through the David M. Kennedy Center for International and Area Studies.

Research Units

Center for Studies of the Family, 940 SWKT

Director: Bruce Chadwick, 938 SWKT

The Center for Studies of the Family is an interdisciplinary research center focusing on studies related to all aspects of the family. The institute encourages and supports research on family-related topics ranging from prenatal development to problems of aging. Many of the faculty in the college are actively engaged in such research and are fellows

of the center. Activities of the center include weekly symposia for sharing and evaluating the findings of faculty and graduate research, publication of a multidisciplinary journal of family life, and an annual research conference.

Women's Research Institute, 940 SWKT

Director: Marie Cornwall, 946 SWKT

Initially established in 1978, the Women's Research Institute became a part of the College of Family, Home, and Social Sciences in September 1983. Since then the institute has awarded research fellowships to upper-division and graduate students for conducting research on women and women's issues in amounts up to \$500 annually for selected projects. Faculty grants became available through the institute in 1984.

Comprehensive Clinic

Director: Richard Bednar, 244 TLRB

The Comprehensive Clinic at Brigham Young University is a unique interdisciplinary training and research facility housing the finest video and computer facilities available and a staff of skilled technicians and secretaries to support graduate student and faculty research. The clinic currently functions as a training facility for an AFA-approved clinical psychology Ph.D. program, AAMFT-approved marriage and family therapy Ph.D. and M.S. training programs, a certified M.S.W. training program, a public nursing program, and an audiology and speech-language pathology M.S. training program. In addition, the clinic provides the university and the broader geographical community with mental health services and serves between 200 and 250 clients each week. The clinic contains eleven counseling rooms, four seminar rooms, and two large audiology and speech-language pathology classrooms equipped with video cameras and portable playback units. Fourteen small session rooms are equipped for audio recording.

The participating departments in the clinic also provide curricula and experience in settings outside the clinic through internships and community education activities. Each department provides additional research and clinical facilities designed to reinforce and integrate student classroom learning in a practical environment. In the Psychology Department, for example, students can enhance their knowledge of research methodology and laboratory procedures by participating in class-related laboratory experiences or faculty-sponsored research programs.

Joseph Fielding Smith Institute for Church History

Director: Ronald K. Esplin, 128 KMB

The institute's purpose is to study the Latter-day Saint past. Its personnel are historians whose primary work is writing and publishing for professional and general Church audiences. The institute also seeks to facilitate the

research of other Church history scholars by providing limited support for research and publication.

Museum of Peoples and Cultures

Director: Joel Janetski, 105 ALLN

Closely associated with the Anthropology Department, the Museum of Peoples and Cultures offers unique research opportunities for students and faculty, several of whom have research offices in the museum. Located south and west of campus in Allen Hall, the museum holds a number of important archaeological and ethnographic collections that have not been systematically analyzed and reported. These collections, which represent Utah Valley, the American Southwest, and Mesoamerica, as well as other parts of the world, provide material for thesis topics, professional publications, and academic credit. Research entities in the museum include the Archaeological Technical Laboratory, which specializes in botanical and minerals analysis, and the Office of Public Archaeology, one of the most active archaeological contracting organizations in the intermountain area, with a permanent staff of eight. The Office of Public Archaeology has recently made a major commitment to research on the Western Anasazi.

Charles Redd Center for Western Studies

Director: Thomas G. Alexander, 4069 HBLL

Established in 1972 under an endowment from Charles Redd, a prominent Utah stockman and philanthropist, the center is charged with promoting the study of all aspects of the American West. The center publishes a monograph series, assists faculty and student research through grants and fellowships, and sponsors lectureships each year.

Jerusalem Center for Near Eastern Studies

Director: Robert C. Taylor, 309 HCEB

On Mount Scopus, overlooking the Holy City, BYU's newly completed Jerusalem Center for Near Eastern Studies provides extraordinary educational opportunities for students and scholars. A seven-tiered, 120,000-square-foot structure, the center houses an extensive learning resource area, classrooms, dormitories, galleries, exhibits, a library, and auditoriums. Scholars and visitors from other universities, as well as students enrolled in its academic programs, are served here. The center's library, for example, offers a selected collection of contemporary Holy Land readings, rare books, special collections, and accessible computer data. For information concerning opportunities for graduate study in Jerusalem, call or write Kent Jackson, chair of Near Eastern Studies (211 HRCB). Travel study information can be obtained from the director of the Jerusalem Center.

Libraries, Archives, and Other Facilities

1. **Wirthlin Public Opinion Archives.** The Political Science Department houses these archives, which contain extensive information on political science and public policy issues. Corollary activities in the department are a Voting Behavior Studies Workshop and a Policy Research Workshop.
2. **Psychology Library.** The Psychology Department maintains a small library that includes twenty major journals plus important reference works.
3. **Home Economics Library Resource Center.** Special resources available to graduate students include journals, carrels, and laboratory facilities with specialized equipment.
4. **Family, Home, and Social Sciences Computing Center.** The center assists faculty and students with social science data processing and other computing needs on mainframe and personal computers. Technical support and consultation services for both statistics and graphics are available to students working on research projects, theses, and dissertations.

Special computer facilities in the Psychology Department include time-share systems. These allow the simultaneous gathering of acoustical and voice perception data from human subjects and the gathering of learning and behavioral economics data from animal subjects.

Laboratories

1. **Cartography Laboratory.** Housed in the Geography Department, this laboratory contains standard cartographic equipment plus a copy camera, a dark room, and printing facilities needed for map production. Students also have access to a geographic information system (using a VAX computer) shared with two other departments.
2. **Early Childhood Laboratories.** Associated with the Family Sciences Department, these excellent facilities provide a practicum setting in which graduate students develop skills in conducting and interpreting research involving small children.
3. **Psychobiology Research Laboratories.** These laboratories are equipped with facilities for analysis of the relationships between brain function and behavioral expression in animals. Specifically, brain anatomical analyses can be done, and patterns of brain electrical activity can be studied.

The college also provides additional research and academic support through the Camilla Eyring Kimball Chair of Home and Family Life, the Lemuel H. Redd, Jr., Chair in Western History, the J. Fish and Lillian F. Smith Chair of Economics, and the Family History Services unit.

College of Fine Arts and Communications

Dean: James A. Mason, Professor, Music, A-410 HFAC
Associate Dean, Graduate Studies: M. Dallas Burnett,
Professor, Communications, A-410 HFAC
Associate Dean: Raymond E. Beckham, Professor,
Communications, A-410 HFAC

The departments in the College of Fine Arts and Communications offer the following graduate degrees:

Art

Art History M.A.
Art Education M.A.
Ceramics M.F.A.
Painting-Drawing M.F.A.
Printmaking-Drawing M.F.A.
Sculpture M.F.A.

Communications

Communications M.A.

Design

Music

Composition M.M.
Music Education M.A. and M.M.
Musicology M.A. and Ph.D.
Performance and Pedagogy M.M.

Theatre and Film

Film M.F.A.
Theatre and Film M.A. and Ph.D.
Theatre, Design, and Technology M.F.A.

Graduate study in the College of Fine Arts and Communications provides students with a substantial theoretical base and with extraordinary performance and professional opportunities. The college or departments in the college supervise the publication of a daily campus newspaper, an on-air radio and television station, and a major motion picture production studio. The Harris Fine Arts Center, which houses the college, contains five speech and drama theatres; two concert halls; two art galleries; journalism, advertising, and broadcast laboratories; and practice rooms for music, dance, and theatre.

Special Facilities

Fine Arts Museum

Scheduled for completion in 1993, BYU's new Museum of Fine Arts will itself be a striking example of art in its architecture. Designed both to receive and reflect light, the building's three levels will feature a variety of display and instructional areas. Each area of the museum, from the permanent collection galleries to the gallery of Asian art, the intimate print and drawing gallery, the sculpture court, the musical instrument galleries, and the various gardens, will be enhanced by its setting and decor. Of special interest to students will be the study center and research library associated with the museum.

BYU's growing permanent collection contains more than 13,000 art pieces representing all major artistic styles in

painting, sculpture, print work, and the decorative arts. Highly prized are the collections of Oriental art featuring Ming and Ch'ing Dynasty jade and art depicting the landscape and inhabitants of the American West.

Art History Slide Library

A major resource for graduate student research and teaching, the slide library houses a collection of 80,000 slide reproductions of paintings, sculptures, architectural structures, and various minor arts. Furthermore, a number of students work in the library on assistantships or internships, some of them doing special research with the collection. A computerized indexing system enables a student to seek and find materials under broad categories of iconographic content—for example, art work dealing with animals, or death, or certain kinds of landscapes.

Communications Research Center

As the heart of the Communications Department research program, the center provides logistical and technical assistance for major research projects. The two-room complex includes computer work stations and a room for data collection and analysis. Here graduate students work with faculty members or receive guidance on their own research in broadcasting, journalism, advertising, public relations, and speech communication.

Radio and Television Studios

In these regular, on-air facilities, graduate students, particularly those in communications, find numerous opportunities to hone their professional skills and engage in experimental projects.

Motion Picture Studio

Graduate students in theatre and film work closely with professionals at the BYU Motion Picture Studio on commercial projects as well as student films. This facility is one of the finest motion picture studios on a university campus in the country.

Theatres

Three major theatres in the Harris Fine Arts Center serve as laboratories for graduate students in acting, directing, and technical theatre.

Concert and Recital Halls

Graduate students have opportunities to perform individually and with groups in both the Madsen Recital Hall and the de Jong Concert Hall in the Harris Fine Arts Center.

Art Studio Space

Excellent studio space for painting, printmaking, and sculpture are provided for graduate students in the Harris Fine Arts Center and at two other locations.

College of Humanities

Dean: Todd A. Britsch, Professor, Humanities, 2054 JKHB

Associate Dean: Douglas H. Thayer, Professor, English, 2054 JKHB

The departments in the College of Humanities offer the following graduate degrees:

Asian and Near Eastern Languages

English

English M.A.

French and Italian

Germanic and Slavic Languages

German M.A.

Humanities, Classics, and Comparative Literature

Comparative Literature M.A.

Humanities M.A.

Linguistics

Linguistics M.A.

Teaching English as a Second Language TESL

Certificate and M.A.

Philosophy

School of Library and Information Sciences

Library and Information Sciences M.L.I.S.

Spanish and Portuguese

Portuguese Language M.A.

Portuguese Literature M.A.

Spanish Language M.A.

Spanish Literature M.A.

Spanish Teaching M.A.

The College-wide Language Acquisition Program offers the following degrees:

Language Acquisition

Arabic M.A.

Chinese M.A.

German M.A.

Japanese M.A.

Korean M.A.

Portuguese M.A.

Russian M.A.

Scandinavian M.A.

Spanish M.A.

Graduate study in the humanities prepares a student with the skills and methods to deal independently and in depth with the major manifestations of human culture—language, literature, the arts, and ideas. Departmental and college-wide programs have been designed to help students critically interpret the materials of the humanities. These programs require careful study of original and secondary sources, development of critical skills, diligent analysis of language, and precise writing of papers, theses, and other research projects. Most programs make intensive use of the library and its resources. Graduate study differs from undergraduate work in placing the primary responsibility for developing a coherent program and for mastering materials directly on the individual student. Independent study, both within and without formal courses, replaces requirement-directed schooling. In addition to the pleasure and stimulation it provides, graduate

education in the humanities is valuable preparation for teaching, scholarship, and other professional training.

Academic and Research Support Areas

Humanities Research Center

Director: Jerry W. Larson, 3060 JKHB

The Humanities Research Center provides an array of technological tools, resources, and expertise to foster quality research and scholarship in the College of Humanities. The center is especially active in the production of teaching and research materials. For example, it houses a Kurzweil Optical Scanner, which has made possible, among other publications, the generation of concordances and dictionaries on particular writers. In addition to computer and audio equipment, the center has a variety of video capabilities. Along with providing research support, the center has in the past few years become a world leader in computer-assisted language instruction and translation.

Center for the Study of Christian Values in Literature

Director: Jay Fox, 3134 JKHB

The center was established in 1980 to affirm the importance of religious and moral values in the creation and study of imaginative literature. It provides both a focus for activity and an encouragement to students, teachers, writers, scholars, and readers who believe in the importance of a value-centered literary tradition. In addition to sponsoring a variety of programs and activities, the center publishes a journal, *Literature and Belief*, and a monograph series.

BYU Studies

Editor: Edward A. Geary, Jr., 3168 JKHB

Fully titled *Brigham Young University Studies, A Voice for the Community of LDS Scholars*, this journal is published quarterly by the College of Humanities. It provides a distinguished outlet for scholarly work in the humanities and social sciences. Editorial internships with the journal and with other college publications are available for graduate students.

Reading-Writing Center

Director: William (Bill) Shakespeare, 1010 JKHB

The center was established to assist students and faculty in improving their reading and writing skills. Graduate students benefit particularly from critical evaluations of drafts of seminar papers and theses. Graduate students with advanced reading and writing skills may serve as interns in the center.

Intensive Language Experiences

English Language Center

Director: Glen W. Probst, 2113 JKHB

The English Language Center offers a program of intensive English language training. Graduate students in Teaching English as a Second Language (TESL) may use the center as part of their training.

Foreign Language Houses

Coordinator: Hans W. Kelling, 2054 JKHB

Graduate students wishing an in-depth language training experience may apply for residence in one of the college's foreign language houses, where all activities are conducted in the designated languages. There are houses for men and for women in French, Russian, Italian, German, Japanese, Spanish, Portuguese, Chinese, and Korean. Grad-

uate students may participate as students or senior residents.

Summer Language Institute

Director: Hans W. Kelling, 2054 JKHB

During the summer term the College of Humanities offers a program that allows a student total immersion in a foreign language while receiving course credit. Housing is provided for participants where the language can be applied on a practical level. Employment is available for graduate students.

College-wide Graduate Program in Language Acquisition

Coordinator: Cheryl Brown, 3184 JKHB, 378-2385

The College of Humanities offers a college-wide program in language acquisition; this program is described in the Languages section of this catalogue.

College of Nursing

Dean: June Leifson, 592 SWKT, 378-4144

Associate Dean, Graduate Studies: Mary Williams, 591 SWKT, 378-5626

The College of Nursing offers an M.S. degree. The primary purpose of the graduate program in nursing is to prepare advanced practitioners and administrators with additional knowledge and skills.

Research Support Facilities

Physiology Laboratory

Director: Camilla Wood, 486 SWKT

The physiology laboratory is well equipped to support a variety of physiological studies by students and faculty. Equipment is available to evaluate protein and amino acids in body fluids such as blood, saliva, and human milk. Researchers have evaluated the immunological system using electrophoresis, isoelectric focusing, and radio-immuno assay. They have also conducted research to determine the energy content of human milk and the con-

centration of glycosylated hemoglobin levels and to study proteins utilizing immunological techniques. The laboratory contains physiograph equipment and an animal room for studies using animal models. Microscopes, electrophoretic equipment, and a bomb calorimeter are also available. Special rooms are equipped for psychosocial research and for EKG testing.

Nursing Clinic

Director: Lana Riddle, 574 SWKT

This clinic is an important component of the Comprehensive Clinic described earlier in connection with the College of Family, Home, and Social Sciences. Staffed with a full-time nurse practitioner, the Nursing Clinic serves clients from the community, gives students practical clinical experience, and supports research in the College of Nursing.

Study Facilities

Graduate students are aided in their work by a graduate research laboratory and a graduate study room in the Spencer W. Kimball Tower, home of the college.

College of Physical and Mathematical Sciences

Dean: Grant W. Mason, Professor, Physics, 270 ESC

Associate Dean: Alvin C. Rencher, Professor, Statistics,
206 TMCB

The departments in the College of Physical and Mathematical Sciences offer the following graduate degrees:

Chemistry

Biochemistry M.S. and Ph.D.

Chemistry M.S. and Ph.D.

Computer Science

Computer Science M.S. and Ph.D.

Geology

Geology M.S.

Mathematics

Mathematics Education M.A.

Mathematics M.A., M.S. and Ph.D.

Physics and Astronomy

Physics M.S. and Ph.D.

Physics and Astronomy Ph.D.

Statistics

Statistics M.S.

Financial Aid. Graduate students can apply for one or a combination of the following types of financial aid: teaching and research assistantships, scholarships, internships (university-sponsored fellowships), and tuition awards. Financial aid is awarded on the basis of merit and availability of funds.

Active in research that supports quality graduate work, the College of Physical and Mathematical Sciences has a number of special facilities and programs that enhance graduate study.

Research Centers and Services

State Centers of Excellence

The state of Utah has established and funded a number of research and development Centers of Excellence, four of them with the principal investigators in the College of Physical and Mathematical Sciences. Patterned after a National Science Foundation project, the centers promote joint efforts between the university and industry in the development of certain needed technologies. The college's four centers are in X-ray imagery, chemical separations, computer-aided education, and supercritical fluid separation technologies.

X-Ray Imagery Center of Excellence and Laser Physics

Group. At present heavily involved in the development of advanced X-ray imaging and X-ray spectroscopy, the laser program is an interdisciplinary effort involving physics, chemistry, and electrical engineering. The award from the state will help finance expanded research into producing optical devices to manipulate soft X rays. With such devices, X rays might be used to see the structure of living cells, to make smaller and faster computers, and to improve defense against ballistic missiles. Collaborative

efforts have been established with Lawrence Livermore National Laboratory, Los Alamos National Scientific Laboratory, and the Materials Science Department at Stanford University. Students have the benefit of both the university environment and the possibility of interaction with physicists in major laser programs throughout the country.

Chemical Separations Center of Excellence. The chemical separations group will be engaged in designing and building chemical separations systems that can selectively bind specific chemical structures with certain ions or molecules. The group hopes, among other things, to find ways to recover silver from waste solutions, to separate potassium from salt, and to reduce lead and nitrate ion concentrations in culinary water.

Computer-aided Education Center of Excellence. The computer-aided education group is interdisciplinary but is based in the Computer Science Department's instruction program. The group will work toward developing improved software for computer-based instruction, especially productivity tools for the creation and delivery of courseware and the application of artificial intelligence techniques to the creation of adaptive teaching systems.

Advanced Supercritical Fluid Separation Technologies Center of Excellence. The center is developing and testing instrumentation for advanced supercritical fluid separation, a new analytical technique first successfully demonstrated at BYU. Researchers are pursuing improvements to ensure reliability and instrument simplicity and to improve methods of sample introduction, separation, and detection. A major goal is to investigate possible application to agrichemicals, surfactants, dyes, carbohydrates, lipids, peptides, nucleosides, metabolites, steroids, and pharmaceuticals.

Center for Thermodynamics

Coordinator: Juliana Boerio-Goates, 139-C ESC

The center was established to correlate the research activity in chemical thermodynamics in the Departments of Chemistry and Chemical Engineering. It facilitates the exchange of ideas and information and coordinates the use of the many sophisticated instruments used to make thermodynamic measurements. Calorimetry is an especially strong part of this program, which also includes research in phase equilibria, solution thermodynamics, and electrochemistry. Eighteen full-time personnel are formally affiliated with the center and are involved in thermodynamic research.

Cancer Research Center

Director: Byron K. Murray, 857 WIDB

The objective of the BYU Cancer Research Center is to make significant scientific contributions toward the control and cure of cancer. Intense investigations of oncogenes and their relation to the development of cancer represents

a major activity within the center. Research projects are being supervised by twenty senior investigators from the Graduate Section of Biochemistry and the College of Biology and Agriculture. It is the combination of their research efforts that will ultimately achieve excellence and enable the stated objective to become reality.

Center for Statistical and Computing Research

Director: H. Gill Hilton, 223-A TMCB

The center operates under the Statistics Department, with full access to all departmental resources, to provide statistical expertise to faculty, graduate students, and off-campus researchers in other disciplines. Areas of particular strength are designing experiments and sample surveys and analyzing the resulting data. Problems are solved by application and adaptation of state-of-the-art methodology and development of new methodology as required.

Center for Fusion Studies

Director: B. Kent Harrison, 285 ESC

The Center for Fusion Studies correlates and promotes research among faculty members and graduate students from the Departments of Physics and Astronomy, Chemistry, and Chemical Engineering in nuclear fusion, with particular attention to low-temperature "cold" fusion, through muon catalysis, and in solid systems such as titanium and palladium. Low-level nuclear reactions have been observed with both methods. Center goals are to study the basic science of nuclear fusion, as well as possible applications to production of useful power and other industrial purposes. BYU collaborates with other universities and laboratories in this work.

Research Programs and Facilities

Solid-State Physics

Experimental and theoretical studies of microscopic and macroscopic mechanisms for structural nonreconstructive phase transitions are in progress. Experimental expertise has been developed in the use of ultrahigh pressures for electrical, thermodynamic, and electron spin resonance measurements on materials in the neighborhood of these transitions. In addition, theoretical studies place an emphasis on the symmetry aspects of the transition.

Astrophysics and Astronomy

Most research in astrophysics and astronomy is observational, much of it conducted with the BYU twenty-four-inch telescope at West Mountain Observatory, although there is also frequent use of other observatories. West Mountain Observatory is twenty miles west of campus and, at 6,800 feet, is a relatively dark and haze-free site. Topics of current or recent research include the evolutionary status of variable stars, especially classical and dwarf Cepheids; the developmental status of both old and young galactic star clusters; globular star clusters; population II stars; interstellar reddening; the reliability of secondary photometric standards; and the galaxian luminosity function.

Computer Science Programs and Laboratories

1. **Computer-based Instruction Program.** See preceding State Centers of Excellence section.
2. **Operating Systems Laboratories.** The Computer Science Department has advanced course work and laboratory facilities to support research in real time process control and in concurrent and distributed processing. Studies are under way on the creation of programming languages and operating systems that will enhance the use of concurrent processes in a distributed environment.
3. **Computer Graphics Laboratories.** Graphics research in the Computer Science Department concentrates on the representation of hyperdimensional objects and on the automatic generation of interactive software for graphical presentations. Current projects include shadowing and shading hyperdimensional objects, creating visual and graphical programming languages, and generating high-quality user interfaces.
4. **Computer Vision Laboratory.** Research in computer vision deals with the recognition and description of two-, three-, and four-dimensional patterns from two-dimensional images. Current projects include extraction and interactive display of three-dimensional medical anatomy and boundary tracking for image segmentation. Future research will address the use of vision in robotics.
5. **Artificial Intelligence and Expert System Laboratories.** Investigations of artificial intelligence techniques for the automating of problem-solving processes that are informal, heuristic, and symbolic in nature. Research currently includes implementation issues, knowledge representation, prototypes and their validation, fuzzy logic, measures of belief, certainty theory, Bayesian probability theory, and logical inferencing.
6. **Interactive Software Systems Laboratory.** This laboratory produces tools that can automatically generate user-interface software. Such tools reduce the cost of developing user-friendly applications. The laboratory also develops techniques to measure the effectiveness of user-interface software.
7. **Networking/Communications Laboratory.** Laboratory experience is provided to students in the design and use of ethernet and packet radio networks plus the management and analysis of network performance. Further research interests are token ring, fiber optics, and microwave and satellite communications.
8. **Neural Networks and Connectionist Computing Laboratories.** Neural networks are computing architectures and learning mechanisms inspired by human brain functions. Research currently explores weaknesses of the von Neumann computer in terms of parallelism, self-organization, and fault tolerance. Targeted applications include adaptive logic devices, dynamic control, logical inferencing, and robotics.

Earth Science Museum

Associated with the Geology Department, this developing museum with affiliated laboratories houses major fossil

groups, including one of the best dinosaur collections in the country. It also offers significant, and in some cases unique, assemblages of rocks, minerals, and maps, providing many research opportunities for faculty and students.

Fission Track Dating Laboratory

This laboratory provides the Geology Department with the geochronological potential to solve problems in stratigraphy and structural geology, to determine rates of uplift and subsequently to aid in thermal modeling, and to provide support for numerous other faculty and student research projects where dating of events is necessary. The laboratory is fully equipped, but samples are sent elsewhere for irradiation.

Calorimetry

More than twenty different calorimeters are functioning in current research projects in the Chemistry Department. Developments at the forefront of calorimetric design, construction, and application are being pursued in flow, mixing, injection, batch, titration, and scanning methods involving isothermal, adiabatic, isoperibol, and conduction calorimetry from ambient to extremes of both temperature and pressure.

Environmental Chemistry

Environmental studies are being conducted on chemistry in the air, soil, water, and complex biomatrices. In the air studies, emphasis is placed on determining chemical species and reactions in both the gas and particulate phase and on source apportionment of pollutants in indoor and outdoor air. An integrated analytical system is being developed to detect and identify trace organic pollutants for a broad spectrum of complex environmental matrices.

Researchers with training in physical, inorganic, analytical, and nuclear chemistry, nuclear physics, and toxicology work cooperatively. Research facilities include environmental chambers and ambient air sampling equipment. Techniques include calorimetry, ICP, electron microscopy, chromatography (IC, SFC, GC, GC/MS), particle-induced X-ray and gamma-ray emission spectroscopy (PIXE and PIGE), Rutherford backscattering, and extended X-ray absorption fine structure (EXAFS) measurements.

Molecular Structure Studies

A recently acquired, state-of-the-art, superconducting nuclear magnetic resonance spectrometer (operating at 500 MHz) ensures that the Department of Chemistry is well

equipped to carry out detailed structural work on large and complex molecular systems. This high-field instrument, together with excellent mass spectrometry, X-ray diffraction, and Fourier transform infrared instrumentation, helps to establish a first-rate analytical and molecular structure-determining facility.

Chemical Separations

The Chemistry Department has extensive programs in chemical separations. These include the design of new instrument techniques and stationary phase materials for capillary gas and supercritical fluid chromatography and the design of new silica gel-bound metal ion complexing ligands for use in the selective liquid chromatographic separation of metal ions. The department has the necessary gas, supercritical fluid, and liquid chromatography equipment for the analytical portion of this research. Equipment for the synthetic organic chemistry portions of these projects includes high-resolution NMR, FTIR, and mass spectrometers.

Statistics Quality Science Laboratory

The role of the Quality Science Laboratory is to facilitate the study and development of tools and techniques for improving the quality of products and services in the industrial, service, and government sectors. The Department of Statistics has administrative responsibility for the laboratory, but it is used by students from various parts of campus for study in quality technologies as well as to further research in the technology of quality control and improvement. Through the support of various industries, the laboratory is furnished with the latest computer equipment and automated measurement equipment for the collection and evaluation of quality-related data.

Graduate Section of Biochemistry

Chair: Donald L. Robertson, 673 WIDB

Offering M.S. and Ph.D. degrees through the Chemistry Department, the Graduate Section of Biochemistry was established to foster research in areas of biochemistry, including molecular biology, and to encourage cooperation among faculty members trained in chemistry and biology. Areas of research include molecular biology of viruses, oncogenes, and chloroplast DNA; enzymology relating to nucleotide metabolism; and biochemical properties of small peptides in terms of their structure and reactions with cell membranes.

College of Physical Education

Dean: Clayne R. Jensen, Professor, Physical Education—Sports, 212 RB

Associate Dean, Graduate Studies: Elmo Roundy, Professor, Physical Education—Sports, 214 RB

Associate Dean: Jay H. Naylor, Professor, Recreation Management and Youth Leadership, 212 RB

The departments in the College of Physical Education offer the following degrees:

Health Sciences

Health Sciences M.S. and M.H.E

Physical Education—Dance

Dance M.A.

Physical Education—Sports

Physical Education M.Ed.

Exercise Science and Athletic Training M.S.

Physical Education Administration, Curriculum, and Instruction Ed.D.

Corrective Physical Education and Rehabilitation Ph.D.

Exercise Physiology Ph.D.

Recreation Management and Youth Leadership

Recreation Management and Youth Leadership M.A.

Therapeutic Recreation M.A.

Research Support Facilities

Human Performance Research Center

Administrator: Garth Fisher (116 RB)

The primary purpose of the center is to support applied and basic research programs of faculty and graduate students on such topics as nutrition and exercise, drugs and exercise, exercise and cardiovascular disease, exercise and weight control, and other contemporary issues in exercise science. Three faculty members work in the center, and a full-time staff person is available to assist with research projects.

In addition to serving graduate students and faculty in physical education, the center works closely with departments in other colleges on campus—notably in the fields of physiology, nutrition, endocrinology, and biochemistry—to broaden the scope of research projects. Graduate students who use the center pursue M.S. or Ph.D. degrees from their individual departments, with emphasis in such

areas as exercise physiology, motor learning, biomechanics, and corrective and rehabilitative sports medicine.

Laboratories Within the Human Performance Research Center

1. **Auxiliary Classroom and Laboratory.** This facility, which contains numerous pieces of motor learning equipment, is the primary laboratory for motor learning classes and activities.
2. **Body Composition Laboratory and Hydrostatic Tank Room.** This facility contains the necessary equipment to accurately and efficiently determine body composition parameters. With computers that assess lung volumes and capacities and that calculate body fat levels, the laboratory and tank room support studies of such subjects as obesity, training effects, and nutritional treatments.
3. **Muscle Biochemistry Laboratory.** This facility contains such sophisticated equipment as a spectrophotometer, metabolic shaker, centrifuge, cryostat, fluorimeter, tissue homogenizer, and other apparatus needed for basic research in exercise biochemistry.
4. **Ergometry Laboratory.** Equipped with a wide variety of devices for measuring work costs both at rest and during work, this laboratory supports research relating to the metabolic costs of various activities—measuring maximum oxidative capacity and evaluating the effects of various training programs on fitness.
5. **Strength Testing and Ergometer Laboratory.** Strength and endurance testing equipment in this laboratory supports research on the effects of different training programs on strength and evaluates strength of any muscle group for any purpose.

Biomechanics Laboratory

Special cameras and other equipment, including a pneumatic digitizer for quantitative analysis of motion, are available to assist researchers in the analysis of performance in sport and dance from a biomechanical perspective.

Learning Resource Center

This center contains eighteen individual study areas for graduate students as well as computer, audio, and video equipment to assist them in their work.

Religious Education

Dean: Robert J. Matthews, Professor, Ancient Scripture, 144 JSB

Religious Education offers graduate minors, but not graduate majors. See Departments of Ancient Scripture and Church History and Doctrine in the Religion section of this catalogue.

Program and Degree Resources

Religious Studies Center, 156 JSB

The dean of Religious Education is also the general director of the Religious Studies Center, which promotes research in ancient studies, the Bible, the Book of Mormon, LDS Church history, the Doctrine and Covenants, the Pearl of Great Price, and world religions.

The center is a supporting and coordinating agency for religion-oriented research throughout the university. Concentrating on research, writing, and other scholarly activities, it is not involved in classroom instruction or degree programs.

The Richard L. Evans Chair of Christian Understanding

Truman G. Madsen, Professor of Philosophy, 165 JSB

The occupant of the Richard L. Evans Chair of Christian Understanding promotes understanding among people of different faiths through teaching and other activities centered in Jesus Christ. The chair was established to articulate to a broad audience the Christ-centered values to which Elder Evans dedicated his life and to promote an enlightening exchange among Latter-day Saints, members of other faiths, and people of good will everywhere.

J. Reuben Clark Law School

Dean: H. Reese Hansen, 348A JRCB, 378-6383

Associate Deans: J. Clifton Fleming, Jr., 510 JRCB,
378-2485; Constance K. Lundberg, 393 JRCB, 378-3210;
Scott W. Cameron, 342 JRCB, 378-6386

Assistant Dean: Kathy D. Pullins, 239-A JRCB, 378-5576

Programs

Juris Doctorate (J.D.)

The J. Reuben Clark Law School offers a six-semester course of graduate professional study leading to the juris doctorate (J.D.) degree. Information about legal education, admissions standards and procedures, and related matters can be obtained from the J. Reuben Clark Law School Bulletin, which is available through the admissions office of the Law School.

Master of Comparative Law (M.C.L.)

The master of comparative law (M.C.L.) degree is conferred upon successful completion of a minimum of 24 credit hours earned during at least two semesters in residence following completion of a J.D. degree or its equivalent outside the United States. Information and applications are available through the admissions office of the Law School.

Special Facilities

J. Reuben Clark Law Building

One of the finest university law school facilities in the country, the J. Reuben Clark Law Building is attractively located on the eastern edge of the campus. Its five floors house nine classrooms, three seminar rooms, a student commons area, a student lunchroom, and ample spaces for student organizations and activities, as well as faculty offices and a law library.

Law Library

Ranking now among the nation's larger law libraries, BYU's law library contains more than 300,000 volumes or equivalents available for student and faculty use. Besides the latest in technological facilities and services, the library also contains 450 individual study carrels that provide privacy and quiet for each law student. Law students also have access to the holdings in the university library, the Harold B. Lee Library.

Special Programs and Activities

Cocurricular Program. In addition to the *Brigham Young University Law Review*, law students publish the *Journal of Public Law* and participate in a Board of Advocates program. The cocurricular program extends law review experience to a larger number of students than would be possible through a single journal.

Other Special Programs. Students obtain experience in trial and appellate practice patterned after the old English Inns through the American Inn of Court I. Minority students may participate in annual summer institutes sponsored by the Council on Legal Education Opportunity and a scholarship program in law for American Indians funded by the Bureau of Indian Affairs.

Student Organizations. Within the Law School, students may participate in a number of organizations, among them the Student Bar Association, the Women's Law Forum, the Family Law Society, the Government and Politics Legal Society, the International and Comparative Law Society, the Minority Law Students Association, the American Indian Law Students Association, and the Natural Resources Law Forum. There are three chapters of legal fraternities on campus and a Law Partners organization for spouses of married law students.

J. Willard and Alice S. Marriott School of Management

Dean: K. Fred Skousen, Professor, Accounting, 730 TNRB
Associate Dean, Graduate School of Management: Lee H. Radebaugh, Professor, Accounting, 730 TNRB
Associate Dean, College of Business: Gary C. Cornia, Associate Professor, Public Management, 730 TNRB
Associate Dean, Director of External Relations: William R. Siddoway, 710-A TNRB

The J. Willard and Alice S. Marriott School of Management is composed of the Graduate School of Management and the College of Business.

Marriott School of Management

The Marriott School of Management is recognized as one of the outstanding management schools in the nation. Faculty are actively engaged in research and publication, and they fill leadership positions in a number of national professional organizations. The school has developed innovative educational programs that include internships, executive visitation programs, special student consulting and research projects, and other activities designed to bring management education and training closer to management practice.

Special Facilities, Programs, and Activities

The N. Eldon Tanner Building, which houses the Marriott School of Management, is one of the finest facilities of its kind. Surrounding the dramatic eight-story atrium at its center are lecture and seminar rooms, study rooms, a computer laboratory, and a working library.

Marriott School of Management National Advisory Council

Consisting of seventy-five to eighty prominent business and government executives, the National Advisory Council lends major support to the Marriott School of Management. Students benefit by interacting with council members in special campus lectures and seminars and by visiting or working with these executives in their respective organizations. Furthermore, the council assists students with placement opportunities, helps develop funding

sources for scholarships, and provides professional development for faculty members.

Executives on Campus Program

This program gives students an opportunity to interact with distinguished business and government leaders who come to campus. These executives visit classes and meet with student organizations as well as participate in the Executive Lecture Series and Entrepreneurship Lecture Series.

Graduate School of Management

The Graduate School of Management is composed of four professional programs:

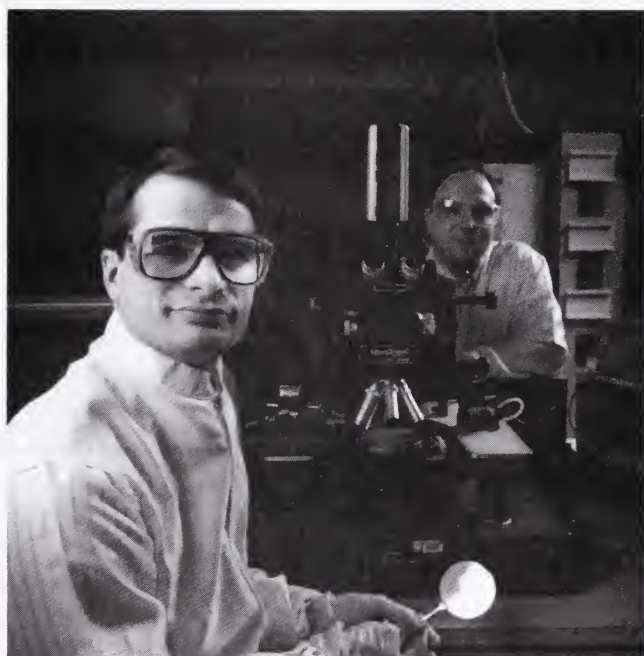
Master of Business Administration
Master of Public Administration
Master of Accountancy
Master of Organizational Behavior

The programs in the Graduate School of Management are designed to prepare qualified students for rewarding careers in management and administration. Classes and study group activities stress the acquisition of professional managerial attributes that will enable students to obtain positions of leadership in public, private, and not-for-profit organizations.

The Graduate School of Management publishes its own bulletin describing programs in detail. Prospective applicants should write directly to the dean's office to obtain a copy.

College of Business

Both the Department of Management Communication and the Department of Managerial Economics teach courses for graduate programs in the Marriott School of Management. However, only the Department of Managerial Economics offers a graduate degree program. For this program students should apply through the Office of Graduate Studies rather than the Graduate School of Management.



Academic Departments, Degrees, and Courses

Agronomy and Horticulture

Chair: Richard E. Terry, 275 WIDB, 378-2760

Graduate Coordinator: Ronald H. Walser, 273 WIDB, 378-4032

Faculty/Specialties

Professors

Horrocks, R. Dwain (1978) Ph.D., Pennsylvania State University, 1967. Crop Physiology, Ecological Modeling.

Jeffery, Larry S. (1984) Ph.D., North Dakota State University, 1966. Weed Science.

Jolley, Von D. (1977) Ph.D., Iowa State University of Science and Technology, 1976. Iron Nutrition, Mineral Nutrition.

Nelson, Sheldon D. (1972) Ph.D., University of California, Riverside, 1971. Soil Physics, Irrigation Management.

Robison, Laren R. (1971) Ph.D., University of Minnesota, Minneapolis, 1962. Plant Genetics.

Terry, Richard E. (1980) Ph.D., Purdue University, Lafayette, 1976. Soil Microbiology.

Associate Professors

Ellsworth, D. Delos (1975) M.S., Cornell University, 1959. Real Estate Appraisal and Analysis.

Walser, Ronald H. (1980) Ph.D., Utah State University, 1975. Fruit Production, Pest Management, Plant Growth Regulators.

Williams, C. Frank (1971) Ph.D., Oregon State University, 1971. Plant Propagation, Turf Management.

Assistant Professor

Allen, Phil S. (1990) Ph.D., University of Minnesota, 1990. Seed Physiology, Ornamental Horticulture.

Graduate Programs and Degrees

Agronomy (M.S.)

Horticulture (M.S.)

Areas of Emphasis

Crop science, developmental agriculture, molecular biology, soil science, turf science.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements*

Agronomy (M.S.)

Horticulture (M.S.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Acceptance by the departmental graduate coordinating committee.
 - C. Entrance examination: GRE general examination; score subject to review.
- II. Prerequisite: Baccalaureate degree in agronomy or horticulture or related field.

Requirements for Degree

I. Credit hours:

A. Thesis option (30):

1. Minimum 24 course work hours plus 6 thesis hours (AgHrt. 699R).
2. Thesis: Completion of the thesis in standard university format or in scientific journal format.

B. Project option (36):

1. Minimum 30 course work hours plus 6 project hours (AgHrt. 698R).
2. Completion of a scholarly project report.

II. Minor: Botany, chemistry, computer science, food science, geology, geography, mathematics, microbiology, physics, statistics, range science, or zoology.

III. Examination: Final oral examination and defense of thesis or of project.

*Obtain a copy of the Graduate Student Handbook from the department office (275 WIDB).

Program and Degree Resources

Benson Institute

BYU Agriculture Station

M. L. Bean Life Science Museum

Skaggs Ranch

Lytle Ranch

Greenhouses and growth chambers

Agronomy and Horticulture Graduate Courses

511. Soil Physics. (3)

Prerequisite: AgHrt. 282, Chem. 105, Math. 113. Recommended: Phcs. 121.

Physical relationships of water, heat, and gases in soils; physical and chemical properties of clays. Mathematical modeling of physical properties and transport processes.

514. Soil Microbiology. (3)

Prerequisite: Chem. 106, 107, or equivalent.

Ecology and role of soil microorganisms in nutrient cycling, decomposition of organic matter and waste materials, and degradation of agricultural chemicals in soil.

520. Saline and Sodic Soils. (3)

Prerequisite: AgHrt. 302, 305, Chem. 105, 106, 107, Math. 110.

Physical and chemical properties of saline and sodic soils and waters—their diagnosis, reclamation, and management for crop production.

540. Crop Physiology. (3)

Prerequisite: AgHrt. 151, 305, 460, Botny. 440.

Plant-soil-climate relationships; crop management practices related to physiological processes in plants.

550. Physiological Development of Horticultural Crops. (3)

Prerequisite: AgHrt. 318, 320, 431, or 451; Botny. 440.

Developmental phenomena in horticultural crops, emphasizing plant growth regulators.

559. (AgHrt.-Botny.) Plant Breeding. (2)

Prerequisite: AgHrt. 151 or equivalent, Botny. 375.

Genetics and methods of plant breeding related to improving agronomic and horticultural crops.

560. Soil and Plant Analysis. (3)

Prerequisite: AgHrt. 305 or Chem. 223.

Laboratory chemical analysis of soils and plant materials in soil and plant research.

595. Agricultural Experimentation: Design and Analysis. (2)

Prerequisite: Stat. 501 or concurrent registration.

Planning, experimental design, and techniques of analysis in agricultural experimentation.

598R. Advanced Topics. (1-2)

Prerequisite: consent of instructor.

Advanced study of selected agricultural topics.

605. Soil-Plant Relationships. (3)

Prerequisite: AgHrt. 282, 305; Botny. 440; organic or biochemistry course.

Soil-plant nutrition including mechanisms of nutrient uptake, transfer and assimilation, mechanisms of nutrient immobilization, and toxicity in soils and plants.

694R. Seminar. (1)

697R. Research. (1-9)

698R. Master's Project. (1-6)

For project option only.

699R. Master's Thesis. (1-9)

Animal Science

Chair: N. Paul Johnston, 375 WIDB, 378-4294

Graduate Coordinator: Richard O. Kellems, 353 WIDB, 378-4220

Faculty/Specialties

Professors

Hoopes, Keith H. (1957) D.V.M., Washington State University, 1956. Reproductive Physiology, Surgery.

Johnston, N. Paul (1971) Ph.D., Oregon State University, 1971. Nutrition, Poultry and Small Animal Reproduction and Management.

Orme, Leon E. (1969) Ph.D., Michigan State University, 1958. Growth and Body Composition, Livestock Evaluation and Selection.

Park, Robert L. (1965) Ph.D., Cornell University, 1962. Animal Breeding and Genetics, Swine and Livestock Production.

Wallentine, Max V. (1962) Ph.D., Cornell University, 1960. Meat Science, Sheep and Livestock Production.

Wiltbank, James N. (1981) Ph.D., University of Wisconsin, Madison, 1955. Reproductive Physiology, Beef Production.

Associate Professors

Kellems, Richard O. (1986) Ph.D., Oregon State University, 1976. Nutrition, Dairy Production.

Roeder, Beverly L. (1990) D.V.M., Ohio State University, 1982; Ph.D., Pennsylvania State University, 1990. Anatomy, Physiology, Surgery, Animal Health, Nutrition.

Thwaites, Richard N. (1990) D.V.M., Colorado State University, 1981. Anatomy, Animal Health, Molecular Biology, Surgery, Physiology.

Graduate Program and Degree

Animal Science (M.S.)

Areas of Emphasis

Animal health, breeding/genetics, developmental agriculture, molecular biology, nutrition, reproduction.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements*

Animal Science (M.S.)

Admission and Entry

I. Application requirements:

A. University deadlines apply.

B. Entrance examinations

1. GRE (GEN: Q, V, A) score subject to review.

2. General Animal Science Exam.

II. Prerequisite: Baccalaureate degree in animal science or in a closely related field.

Requirements for Degree

I. Credit hours:

A. Thesis option (30):

1. Minimum 24 course work hours plus 6 thesis hours (AnSci. 699R).

2. Thesis: Completion of the thesis in standard university format or in scientific journal format.

B. Project option (36):

1. Minimum 30 course work hours plus 6 project hours (AnSci. 698R).

2. Completion of a scholarly project report.

II. Required courses: Stat. 501; AnSc. 507; 510 or 574; 692R (each semester of residence); Zool. 503, 504.

III. Minor: Agribusiness, agronomy, horticulture, botany, chemistry, computer science, food science and nutrition, microbiology, statistics, or zoology.

IV. Examinations:

A. Written and oral examination on course work.

B. Oral defense of thesis.

*Obtain a copy of the Graduate Student Handbook from the department office (375 WIDB).

Program and Degree Resources

Benson Institute

BYU Agriculture Station

834-acre farm with a 400-cow dairy near Spanish Fork

7,800-acre Skaggs Research Ranch

15-acre Provo facility

Modern meat laboratory

Animal Science Graduate Courses

507. Advanced Animal Nutrition. (4)

Prerequisite: AnSc. 207; Chem. 152 or equivalent. Recommended: Chem. 181.

Functions of nutrients in metabolism, measuring feed values, assessing nutrient requirements.

510. Advanced Reproductive Physiology. (4)

Prerequisite: AnSc. 310.

Endocrinology and techniques for research and for improvement of livestock reproduction.

574. (AnSc.-Botny.) Introduction to Population Genetics. (3)

Prerequisite: introductory course in genetics and in statistics.

Quantitative study of factors influencing changes in gene frequencies in natural and domestic animal and plant populations.

591R. Selected Topics in Animal Science. (0.5-3)

Prerequisite: consent of instructor.

595R. Special Problems in Animal Science. (0.5-2)

Prerequisite: consent of instructor.

599R. Cooperative Education. (2-9)

Prerequisite: approval from department cooperative education coordinator.

On-the-job experience in livestock or meat production practices, veterinary medicine, or research. On- or off-campus opportunities.

692R. Seminar. (1)

698R. Master's Project. (1-9)

699R. Master's Thesis. (1-9)

Anthropology

Chair: Donald W. Forsyth, 700 SWKT, 378-3058

Faculty/Specialties

Professors

Berge, Dale L. (1968) Ph.D., University of Arizona, 1968.

Historical Archaeology.

Hawkins, John P. (1974) Ph.D., University of Chicago, 1978.

Social Anthropology, Ethnicity, Kinship and Family, Central America.

Matheny, Ray T. (1964) Ph.D., University of Oregon, 1968.

Archaeology, Ceramic Typology; Mesoamerica, Southwest.

Associate Professors

Forsyth, Donald W. (1979) Ph.D., University of

Pennsylvania, 1979. Archaeology, Ceramic Analysis, Ethnohistory, Mesoamerica, Great Basin.

Janetski, Joel C. (1989) Ph.D., University of Utah, 1983.

Archaeology, Ethnohistory, Hunter-Gatherer Studies, Economics, Great Basin, Southwest.

Assistant Professors

Clark, John E. (1990) M.A., Brigham Young University,

1979. Archaeology, Political and Economic Institutions, Cultural Evolution, Complex Societies, Lithic Studies, Primitive Technologies, Mesoamerica.

Johnson, David J. (1987) Ph.D., University of Utah, 1987.

Archaeology, Archeometry, Ancient Trade, Middle East, Africa.

Knowlton, David (1990) Ph.D., University of Texas, Austin,

1988. Cultural Anthropology, Political and Economic Institutions, Nationalism, Ethnicity, Andes.

Graduate Program and Degree

Anthropology (M.A.)

The aim of this program is to prepare (1) anthropologists capable of productive employment at a junior professional level upon receiving an M.A. degree, or (2) motivated students who desire to earn the Ph.D. degree in outstanding graduate programs elsewhere.

The subject emphasis in archaeology. The department's geographical specialties in archaeology are the Intermountain West (which verges into the southwestern cultural area in southern Utah), Mexico, Guatemala, and the Middle East. The university conducts field research in each of those areas, and qualified students may participate. Also, historic site excavations in Utah, Illinois, and New York have given students experience at mining, military, village, and LDS Church history sites.

Rather than emphasizing specialized or topical interests, however, the program equips the graduate with the basics of professional anthropology: a broad and versatile perspective and the ability (1) to define a research problem, (2) to choose tools wisely for approaching it, (3) to gather and analyze data efficiently and creatively, and then (4) to communicate results and recommendations effectively.

Some assistantships, grants, and employment are offered by the department and the Museum of Peoples and Cultures, but the funds are limited. An attempt is made to provide support for as many students as possible rather than generously support a few. The Office of Public Archaeology division of the museum regularly gives employment and experience to students prepared to participate in contract archaeology projects with them.

The M.A. program is explained in more detail in the Graduate Program Description obtainable by writing or calling the Department of Anthropology.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Anthropology (M.A.)

Only a broad discussion of requirements is provided here. The department sends each prospective graduate student a detailed, step-by-step outline of expectations, requirements, and guidelines for progress through the program (Graduate Program Description); see the department for a copy. The student must return a form indicating that he or she has read the detailed guidelines, understands them, and agrees to be governed by them. This is done because requirements sometimes change slightly in the interval between submission of catalogue copy and publication of the finished catalogue. By writing, calling, or visiting the department, prospective students will receive the most up-to-date and appropriate information.

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Entry times: Fall and winter semesters only.
- III. Application Requirements:
 - A. General GRE score; score subject to review and should be entered on line 11 of Part D of the application form. Foreign students who do not have English as a native language must take the TOEFL exam and submit the score with the application.
 - B. Submission of a letter of intent that specifies particular areas of interest. This letter will provide the basis for assignment of a temporary faculty advisor who will work with the applicant until a thesis committee is organized.
- IV. Prerequisite: Undergraduate degree in anthropology. If a student's bachelor's degree is not in anthropology, the student may be admitted provisionally while completing appropriate background course work.

Requirements for Degree

- I. Credit hours (33): Minimum 27 hours plus 6 thesis hours (Anthr. 699R); a minimum of 20 under direct instruction of professional anthropologists at BYU or in another acceptable department. Thesis, reading, internship, and individual work do not count toward these 20 hours.
- II. Committee: Each student identifies two faculty members and obtains their consent to serve on his or her graduate committee. One of them will become chair of the student's advisory committee, and the other will serve on it. The committee and the student agree on a curriculum plan in accordance with the Graduate Program Description (available from the department).
- III. Required core courses: Anthr. 505, 534; 550 or 551; 590, 605, 615, 699R.
- IV. Additional courses: 9 hours from Anthr. 621-629, 672, 690R; electives.
- V. Thesis.
- VI. Examinations:
 - A. Written comprehensive examination at or near completion of required courses and before undertaking serious work on thesis.
 - B. Oral defense of thesis.

Anthropology Minor

A minor in anthropology can add a cross-cultural perspective, useful for people with international or multicultural interests in the following majors or fields of interest: nutrition, education (either elementary or secondary), educational leadership, counseling, international and area studies, psychology, social work, sociology, art, communications, theatre and film, language, business administration, public administration, applied economics, family sciences, marriage and family therapy, geography, or history.

Requirement: Minimum 15 hours.

Program and Degree Resources

Charles Redd Center for Western Studies and Lemuel H. Redd, Jr., Chair in Western History

Joseph Fielding Smith Institute for Church History
Museum of Peoples and Cultures
New World Archaeological Foundation

Anthropology Graduate Courses

- 505. Anthropological Theory.** (3)
Analysis of the development of anthropological theory and current issues in anthropological thought.
- 534. Social Anthropology.** (3)
Political, economic, and social institutions in cultural systems. Emphasis is on issues.
- 537R. Communication and Culture.** (3)
Course designed for higher-level work load while attending Anthr. 309, 420, or 437.
- 550. (Anthr.-Ling.) Sociolinguistics.** (3)
Research and theory in anthropological linguistics and sociolinguistics.
- 551. (Anthr.-Ling.) Anthropological Linguistics.** (3)
Language in culture and society: development, typology, and description.
- 590. Biological Anthropology.** (3)
Issues in human genetics, diversity, and origins.
- 605. Archaeological Method and Theory.** (3)
Current theoretical and methodological trends and developments in archaeological research.
- 615. History of Archaeological Thought.** (3)
Historical approach to the development of archaeological knowledge, method, and theory; emphases on North America and individual contribution.
- 621. Issues in Great Basin Prehistory.** (3)
Overview of Great Basin prehistory. Primary researchers and an in-depth focus on current issues.
- 623. Issues in Historic Archaeology.** (3)
In-depth review of issues, trends, and methods of historic archaeology.
- 625R. Issues in Mesoamerica Prehistory.** (3)
Current issues in archaeological research in Mesoamerica.
- 627. Issues in Near Eastern Prehistory.** (3)
Current issues in Near Eastern archaeological research.
- 629. Issues in Southwestern Prehistory.** (3)
Current issues in archaeological research in the American Southwest.
- 655R. Field School Supervision.** (2)
- 672. Special Scientific Techniques for Archaeology.** (3)
Dating and analytical techniques using methods of chemistry, physics, etc.
- 690R. Seminar.** (2-3)
Special topics in archaeology.
- 694R. Readings.** (1-3)
Prerequisite: consent of supervising instructor.
Reading about 1,000 pages per credit hour and providing required products.

695R. Research. (1-3)

Prerequisite: consent of supervising instructor.

696R. Museum Projects. (1-3)

Prerequisite: consent of supervising instructor.

699R. Master's Thesis. (1-9)**Art**

Chair: Robert L. Marshall, B-509 HFAC, 378-4429

Graduate Coordinators:

Art Education: Sherron D. Hill, C-502-C HFAC, 378-6003

Art History: Steven Bule, D-501-B HFAC, 378-2235

M.F.A. Programs: W. Wayne Kimball, Jr., B-481-C HFAC, 378-3033

Faculty/Specialties**Professors**

Barsch, Wulf E. (1974) M.F.A., Brigham Young University, 1972. Painting, Printmaking.

Christensen, James C. (1976) M.A., Brigham Young University, 1968. Painting.

Day, Michael D. (1983) Ed.D., Stanford University, 1973. Art Education.

Kimball, W. Wayne, Jr. (1984) M.F.A., University of Arizona, 1970. Printmaking.

Marshall, Robert L. (1969) M.A., Brigham Young University, 1968. Painting.

Myer, Peter L. (1972) M.F.A., University of Utah, 1959. Painting.

Associate Professors

Allen, Von D. (1984) M.F.A., Syracuse University, 1983. Ceramics.

Hadlock, Neil (1990) M.F.A., Brigham Young University, 1971. Sculpture.

Hamilton, Charles Mark (1974) Ph.D., Ohio State University, 1978. Architectural History.

Hill, Sherron D. (1981) Ph.D., University of Iowa, 1973. Art Education.

Smith, Bruce H. (1977) M.F.A., University of Utah, 1968. Painting.

Assistant Professors

Beattie, Donna Kay (1989) Ph.D., University of Kansas, 1990. Art Education, Measurement and Evaluation.

Bule, Steven (1984) Ph.D., Ohio State University, 1987. Art History, Italian Renaissance.

Gehring, Brent D. (1982) M.F.A., Brigham Young University, 1972. Sculpture.

Haltem, Hagen G. (1978) M.F.A., Kunstakademie, Dusseldorf, Germany, 1976. Painting.

Johnson, Mark J. (1987) Ph.D., Princeton University, 1986. Art History, Roman/Early Christian.

Peacock, Martha (1987) Ph.D., Ohio State University, 1989. Art History, Northern Baroque.

Graduate Programs and Degrees

Art Education (M.A.)

Art History (M.A.)

Art Studio (M.F.A.)

Ceramics (M.F.A.)

Painting—Drawing (M.F.A.)

Printmaking—Drawing (M.F.A.)

Sculpture (M.F.A.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements**Art Education (M.A.)**

The M.A. program in art education offers two options.

Option A requires a research-oriented thesis, and Option B requires development of a practical curriculum project.

Option A is intended for individuals who plan to pursue a Ph.D. or an Ed.D. in art education. The required course work and thesis preparation will help develop research and writing skills that are necessary for students to compete in a doctoral program.

Option B is intended for individuals who teach art and desire professional and personal development that will improve their abilities to teach and make art. The required course work and curriculum project will help students develop understanding and skills for professional leadership in art education.

Admission and Entry**I. Application requirements:**

A. Deadlines: University deadlines apply. March 1 for financial consideration (tuition and assistantships) for academic year.

B. Slide portfolio of applicant's recent work.

C. One or two written papers demonstrating applicant's writing skills.

D. GPA: Minimum of 3.0 for last 60 hours.

II. Prerequisite:

A. Baccalaureate degree in art education from an accredited institution. Applicants holding other teaching degrees may be considered if art deficiencies are completed to the satisfaction of the art education admissions committee.

B. Certification to teach in public schools at the elementary or secondary level.

C. Minimum two years of teaching experience.

III. Entry times: Fall, winter, spring, summer.**Requirements for Degree**

I. Credit hours (36): Minimum 30 course work hours from 500- and 600-level courses, plus 6 thesis or project hours (Art 699R or 698R).

II. Select graduate advisory committee during first semester and submit study list.

III. Course requirements:

A. 12 hours of art education classes.

B. 12 hours divided among art studio and art history courses.

C. 6 elective hours (may include approved courses taken outside the department).

IV. Acceptance by department of thesis or curriculum project proposal.

V. Thesis or curriculum project.

VI. Examinations:

A. Written comprehensive examination during final semester of residency.

- B. Oral defense of thesis or project.

Art History (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: March 1 for fall semester entrance; September 1 for winter semester entrance.
 - B. GPA: Minimum of 3.2 for last 60 hours.
- II. Prerequisite: Baccalaureate degree in art history or related field.

Requirements for Degree

- I. Credit hours:
 - A. Thesis option (30): Minimum 24 course work hours plus 6 thesis hours (Art 699R).
 - B. Two-paper option (33): Minimum 33 course work hours plus 6 hours of Art 698R.
- II. Select graduate advisory committee during first semester and submit study list.
- III. Required courses: The M.A. program is designed to allow maximum exposure to the various areas of art history. Courses should be selected in consultation with the graduate coordinator and advisory committee chair.
- IV. Language requirement: Reading knowledge of at least one foreign language, preferably French or German; similar competence recommended in a second language.
- V. Thesis or two extended papers.
- VI. Examinations:
 - A. Final written comprehensive examination.
 - B. Oral defense of thesis.

Specific information on course and program requirements is available from the Department of Art.

Art Studio (M.F.A.)

- Ceramics (M.F.A.)
- Painting—Drawing (M.F.A.)
- Printmaking—Drawing (M.F.A.)
- Sculpture (M.F.A.)

Admission and Entry

- I. Number of resident M.F.A. candidates is restricted by availability of individual studio space.
- II. Application requirements:
 - A. Deadlines: March 1 for fall semester entrance; September 1 for winter semester entrance.
 - B. GPA: Minimum 3.0 for last 60 hours.
 - C. Slide portfolio of applicant's work.
- III. Prerequisite: Baccalaureate degree in art or equivalent with a minimum of 20 hours of upper-division course work and 12 hours of art history.
- IV. Applicants with M.A. degree in art from another institution may request department approval to transfer graduate credit.
- V. Entry times: Fall and winter semesters.

Requirements for Degree

- I. Credit hours (60): Minimum 60 hours of approved course work, including 6 hours of project (Art 697R).
- II. Course requirements:

- A. 30 hours in area of emphasis (ceramics, painting—drawing, printmaking—drawing, sculpture).
- B. 9 hours in supportive area (may exceed departmental boundaries if approved by committee); 3 must be in studio.
- C. 12 hours of art history, criticism, and readings to include 3 hours of Art 598R, and 3 hours of Art 610 or 612.
- D. 1 hour of seminar (Art 595R) required during each semester in residence.
- III. Filing of study list (including selection of graduate advisory committee) during first semester.
- IV. Slide presentation of recent work (to studio faculty) at conclusion of each semester. A faculty rating of satisfactory, marginal, or unsatisfactory is used to determine progress and continuation in the program. Three semester ratings lower than satisfactory, two unsatisfactory ratings, or a marginal rating followed by an unsatisfactory rating will result in dismissal from the program.
- V. Preliminary exhibition and review for candidacy. At the end of the semester in which all course work except Art 697R (M.F.A. project) is completed, the student is required to: (1) install, for approval, a preliminary exhibition; (2) have an examination to determine competency in course work; (3) submit a written proposal for his or her final project. Successful completion of the above advances the student to candidacy, wherein he or she is authorized to execute final M.F.A. project.
- VI. Final project and formal written project report. The final project must be produced and exhibited while enrolled in Art 697R (M.F.A. project). Exhibitions and written reports of final projects of all M.F.A. candidates are required and will be held by the department at a designated time each year (usually in March).
- VII. Examination: Oral defense of project and written project report.

Art Education Graduate Courses

578R. Art Education Studio. (3)

Includes M.A. courses in ceramics, drawing, figure drawing, oil painting, aqueous painting, printmaking, crafts, sculpture.

677R. Research in Art Education. (3)

Research methods applied to art education inquiry.

678R. Issues and Trends in Art Education. (3)

Historical review emphasizing recent issues in art education.

679R. Special Problems in Art Education. (3)

Specific problems investigated, discussed, and evaluated, depending on student needs.

Elementary Art Education

Secondary Art Education

Teaching Art on the College Level

Curriculum Development in Art

Aesthetic Education

Art and the Exceptional Student

Administration of Art Programs
Art Criticism

698R. M.A. Curriculum Project. (1-6)

699R. Master's Thesis. (1-6)

Art History Graduate Courses

510. Western Architecture. (3)

Critical evaluation of major movements in Western architecture.

520. Museology 1. (3)

Theoretical and administrative aspects of museum work.

521. Museology 2. (3)

Prerequisite: Art 520.

Functional aspects of museum work.

530. Teaching Art History in the Public Schools. (3)

Conceptual methodology of teaching art history in the public schools.

600R. Individual Study in Art History. (1-8) Prerequisite: Art 211, 212, 298.

In-depth study into any chosen art historical era.

601. Art of Egypt and Mesopotamia. (3)

Social, political, and religious conditions that produced and found expression in the art of Egypt and Mesopotamia.

602. Greek Art. (3)

History and appreciation of Greek art; consideration of formative cultures.

603. Roman Art. (3)

Art and architecture of the Etruscans and Romans.

604. Early Christian and Byzantine Art. (3)

Evaluation of the impact of Byzantine art on the Near East and Europe.

606. Italian Renaissance. (3)

Major artists, monuments, and influences of the Renaissance.

607. Northern Renaissance Art. (3)

Art from Van Eyck to Bruegel.

609. Nineteenth-Century European Art. (3)

History of nineteenth-century art in Europe and America.

610. Modern Art. (3)

Critical evaluation of trends in modern art following the death of Cezanne.

611. Modern Architecture. (3)

Critical review of the roots and evolution of modern architecture.

612. Contemporary Art. (3)

Critical evaluation of trends in art since 1945.

613. Northern Baroque Art. (3)

History of baroque painting and sculpture in Flanders and Holland.

614. Southern Baroque Art. (3)

History of baroque painting, sculpture, and architecture in Italy, Spain, and France.

615. American Architecture and City Planning. (3)

Critical evaluation of American architecture and city planning; emphasizes sources.

617. American Painting and Sculpture to 1913. (3)

American painting and sculpture from the seventeenth century to 1913.

618. Early Medieval and Islamic Art. (3)

Survey of art and architecture of Western Europe and Islamic lands from A.D. 500 to 1050.

619. Romanesque and Gothic Art and Architecture. (3)

Major monuments in architecture, sculpture, and painting from the Romanesque and Gothic periods.

695R. Art History Seminar. (3)

699R. Master's Thesis. (1-6)

Art Studio Graduate Courses

540. Business Practices for Artists. (2)

595R. Seminar. (1)

Student and faculty analysis of curriculum relationships, projection of student objectives, contemporary topics, and visits to current exhibits.

598R. Readings. (1-3)

Graduate readings in the visual arts.

621R. Graduate Drawing Studio. (1-8)

Prerequisite: admission to graduate program.

622R. Graduate Figure Drawing Studio. (1-8)

Prerequisite: Art 621R.

627R. Graduate Painting Studio. (1-8)

650R. Graduate Printmaking Studio. (1-8)

656R. Graduate Sculpture Studio. (1-8)

659R. Graduate Ceramics Studio. (1-8)

697R. M.F.A. Project. (1-6)

Botany and Range Science

Chair: Wilford M. Hess, 401 WIDB, 378-2582

Graduate Coordinator: Kimball T. Harper, 489 WIDB, 378-2129

Faculty/Specialties

Professors

Andersen, William R. (1966) Ph.D., University of California, Davis, 1963. Plant Physiological Genetics.

Brotherson, Jack D. (1969) Ph.D., Iowa State University of Science and Technology, 1969. Community Ecology, Range Management.

Cates, Rex G. (1985) Ph.D., University of Washington, 1971. Plant/Herbivore Interactions, Ecological Chemistry, Ecosystem Processes.

Flinders, Jerran T. (1976) Ph.D., Colorado State University, 1971. Wildlife Behavior and Wildlife Habitat.

- Harper, Kimball T. (1973) Ph.D., University of Wisconsin, Madison, 1963. Community Ecology, Plant Reproductive Biology.
- Hess, Wilford M. (1962) Ph.D., Oregon State University, 1962. Ultrastructure, Plant Pathology.
- Rushforth, Samuel R. (1970) Ph.D., Brigham Young University, 1970. Algology (especially diatoms), Evolutionary Morphology.
- Smith, Bruce N. (1974) Ph.D., University of Washington, 1964. Plant Physiology, Photosynthesis, Growth.
- Tidwell, William D. (1966) Ph.D., Michigan State University, 1966. Paleobotany, Anatomy and Morphology.
- Vallentine, John F. (1968) Ph.D., Texas A&M University, 1959. Grazing Management, Ranch Management and Development.
- Weber, Darrell Jack (1969) Ph.D., University of California, Davis, 1963. Plant Biochemistry and Pathology.
- Welsh, Stanley L. (1960) Ph.D., Iowa State University of Science and Technology, 1960. Plant Systematics.

Associate Professors

- Cox, Paul Alan (1983) Ph.D., Harvard University, 1981. Plant Evolutionary Ecology, Tropical Ecology, Ethnobotany.
- St. Clair, Larry Lee (1976) Ph.D., University of Colorado, 1984. Lichen Ecology.

Assistant Professors

- Anderson, Val Jo (1989) Ph.D., Texas A&M University, 1989. Range Ecology, Ecophysiology.
- Fairbanks, Daniel J. (1988) Ph.D., University of Arizona, 1988. Genetics, Molecular Biology.

Graduate Programs and Degrees

- Biological Science Education (M.S.)
Botany (M.S.)
Genetics (M.S.)
Range Science (M.S.)
Wildlife and Range Resources (M.S.)
Botany (Ph.D.)
Genetics (Ph.D.)
Wildlife and Range Resources (Ph.D.)

Areas of Emphasis

Biotechnology, molecular biology, natural resource development.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements*

- Biological Science Education (M.S.)
Botany (M.S.)
Genetics (M.S.)
Range Science (M.S.)
Wildlife and Range Resources (M.S.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examinations:
 1. General GRE and advanced biology subject test with recommended scores of 1100 on Q

- and V in general test and in 50th percentile on subject test.
2. Oral diagnostic examination.
3. Foreign students must submit TOEFL scores.

II. Prerequisite:

- A. Baccalaureate degree in botany or equivalent for biological science education, botany, or genetics program applicants.
- B. Baccalaureate degree in range, wildlife, or equivalent for range science or wildlife and range resources program applicants.

Requirements for Degree

- I. Credit hours (30): Minimum 24 approved course work hours plus 6 thesis hours (Botny. 699R or Range 699R).
- II. Required course: Botny. 691R or Range 691R (each semester of residence).
- III. Thesis: Standard university thesis format or journal publication format.
- IV. Examinations:
 - A. Defense of research design
 - B. Oral examination on course work.
 - C. Oral defense of thesis.

Botany (Ph.D.)

Genetics (Ph.D.)

Wildlife and Range Resources (Ph.D.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examinations:
 1. General GRE and advanced biology subject test with recommended scores of 1100 on Q and V in general test and in 50th percentile on subject test.
 2. Oral diagnostic examination.
 3. Foreign students must submit TOEFL scores.
- II. Prerequisite: Master's degree in field or equivalent.

Requirements for Degree

- I. Credit hours (54): Minimum 36 hours course work plus 18 hours of dissertation (Botny. 799R or Range 799R).
- II. Required course: Botny. 691R or Range 691R (each semester of residence).
- III. Skill requirement: Includes 21 hours in skill subject area of foreign languages, mathematics, statistics, and/or computer science. Consult graduate coordinator for details.
- IV. Dissertation: Standard university dissertation format or journal publication format.
- V. Examinations:
 - A. Defense of research design.
 - B. Comprehensive written and oral examinations on completion of skill requirement and course work.
 - C. Oral defense of dissertation.

*All degree options: Obtain a copy of the Graduate Student Handbook from the department office (401 WIDB).

Program and Degree Resources

Benson Institute
BYU Agriculture Station
Electron Optics Laboratory
Greenhouses and growth chambers
Harrison Arboretum
Lytle Ranch
M. L. Bean Life Science Museum
USFS Shrub Sciences Laboratory

Botany Graduate Courses

500. (Botny.-Range) Chemical and Physiological Ecology. (3) On dem.

Prerequisite: Biol. 200 or equivalent, Botny. 350 or equivalent, or consent of instructor.

Secondary metabolites and their role in population, community, and ecosystem phenomena.

510. Advanced Taxonomy. (3) On dem.

Prerequisite: Botny. 210 or consent of instructor.

Review of taxonomic literature and of research methods. One three-day field trip arranged.

515. (Botny.-Range) Agrostology: Taxonomy and Ecology of Grasses. (3)

Prerequisite: Botny. 210.

Classification and ecology of grasses, emphasizing important forage species.

520. Ethnobotany. (3) On dem.

Prerequisite: Botny. 120.

Use of plants by diverse human cultures. Integration of current anthropological and botanical literature, emphasizing ethnotaxonomies, survival strategies, and ethnomedicine.

521. Ethnobotany Practicum. (1-5) On dem.

Prerequisite: Botny. 520.

Ethnobotanical research. May require field trip outside continental U.S. Emphasizes participant observation, interviewing techniques, documentary video and film, botanical collecting techniques, and chemical extraction.

522. Biological Instrumentation. (2)

Prerequisite: graduate status or consent of instructor.

Theory and application of research instruments to biological problems.

523. Biological Instrumentation Laboratory. (2)

Prerequisite: Botny. 522 or concurrent registration.

Operating research instruments.

526. (Botny.-Zool.) Cell Biology. (3) On dem.

Prerequisite: introductory course in biochemistry.

Molecular physiology and ultrastructure of cells, emphasizing eukaryotic organisms.

530. (Botny.-Range) Wildland Shrubs. (3)

Taxonomy and ecology of wildland shrubs. Field trip required.

530. Scanning Electron Optics. (3)

Prerequisite: consent of instructor.

Theoretical and practical scanning electron microscopy of biological, physical science, and engineering samples.

531. Transmission Electron Optics. (3) On dem.

Prerequisite: consent of instructor.

Theoretical and practical transmission electron microscopy of biological, physical science, and engineering samples.

534. Lichenology. (3) On dem.

Detailed study of lichens, including classification, morphology, and ecology. Field trip required.

539. Paleobotany. (3) On dem.

Prerequisite: Botny. 105, Geol. 103.

Morphology and relationships of fossil plants.

540R. Advanced Topics in Plant Physiology. (3) On dem.

Prerequisite: Botny. 440 or consent of instructor.

550. Plant Geography. (3) On dem.

Distribution of plant species and communities in the light of present and past climates.

551. (Botny.-Range) Quantitative Ecology. (3)

Prerequisite: Botny.-Zool. 350 or equivalent, Stat. 221, 222, or 501.

Methods of community analysis.

552. (Botny.-Range-Zool.) Terrestrial and Rangeland Ecosystems. (4)

Prerequisite: Botny.-Zool. 350 or equivalent, Stat. 221, 222, or 501.

Biotic communities of the earth; population dynamics; reproductive, life-form, and longevity patterns; species interactions; structure, dynamics, and evolution of communities.

554. Population and Conservation Biology. (3) On dem.

Prerequisite: Botny.-Zool. 350 or equivalent.

Analysis of populations in natural settings; theoretical and practical strategies for conservation of endangered biota and preservation of biodiversity.

559. (Botny.-AgHrt.) Plant Breeding. (2)

Prerequisite: AgHrt. 151 or equivalent, Botny. 375.

Genetics and methods of plant breeding related to improving agronomic and horticultural crops.

574. (Botny.-AnSc.) Introduction to Population Genetics. (3)

Prerequisite: introductory course in genetics and in statistics.

Quantitative study of factors influencing changes in gene frequencies in natural and domestic animal and plant populations.

610. Botanical Terminology and Nomenclature. (2) On dem.

Prerequisite: consent of instructor.

Botanical terminology, including the contributions of Latin and Greek words, their gender, number, and case.

630. Angiosperm Morphology. (4) On dem.

Prerequisite: familiarity with taxonomy, anatomy, and physiology or biochemistry.

Structures, relationships, and evolution of flowering plants.

650R. Advanced Plant Ecology. (2) On dem.

Current trends in ecological research and philosophy.

678. Organic Evolution. (3) On dem.

Prerequisite: introductory course in genetics or consent of instructor.

691R. Graduate Seminar. (1)

697R. Special Problems. (1-6)

699R. Master's Thesis. (1-9)

799R. Doctoral Dissertation. (1-9)

Range Science Graduate Courses

500. (Range-Botny.) Chemical and Physiological Ecology. (3) On dem.

Prerequisite: Biol. 200 or equivalent, Range-Zool. 354 or equivalent, or consent of instructor.

Secondary metabolites and their role in population, community, and ecosystem phenomena.

505. Wildlife Law Enforcement. (3)

Prerequisite: Biol. 200 or equivalent.

Current and historical principles of federal and state wildlife law enforcement, case development, evidence, evaluation, human rights, and testimony.

508. Physiological Plant Ecology. (3)

Influence of environmental parameters on plant growth and function, including plant morphological and physiological adaptations.

515. (Range-Botny.) Agrostology: Taxonomy and Ecology of Grasses. (3)

Prerequisite: Botny. 210.

Classification and ecology of grasses, emphasizing important forage species.

527. (Range-Botny.) Wildland Shrubs. (3)

Taxonomy and ecology of wildland shrubs. Field trip required.

551. (Range-Botny.) Quantitative Ecology. (3)

Prerequisite: Range-Zool. 354 or equivalent, Stat. 221, 222 or 501.

Methods of community analysis.

552. (Range-Botny.-Zool.) Terrestrial and Rangeland Ecosystems. (4)

Prerequisite: Range-Zool. 354 or equivalent, Stat. 221, 222 or 501.

Biotic communities of the earth; population dynamics; reproductive, life-form, and longevity patterns; species interactions; structure, dynamics, and evolution of communities.

561. Watershed Management. (3)

Prerequisite: Range-Zool. 354 or equivalent.

Water-producing characteristics of forest and rangelands, emphasizing laboratory and field studies of soil and vegetation.

565. Wildlife Behavioral Ecology. (3)

Prerequisite: Biol. 200 or equivalent, Range-Zool. 354 or equivalent.

Integration of the principles of ethology, sociobiology, and behavioral ecology using examples from wildlife and

livestock. Behavioral sampling methods stressed. Field trip required.

691R. Graduate Seminar. (1)

697R. Special Problems. (1-6)

Advanced study of selected range topics: fire ecology, grazing systems, wetlands and wildlife, ecology, evolutionary biology, plant herbivore interactions, and wildlife behavioral ecology.

699R. Master's Thesis. (1-9)

799R. Doctoral Dissertation. (1-9)

Chemistry

Chair: Earl M. Woolley, 226 ESC, 378-3669.

Graduate Coordinators: Richard T. Hawkins, 310-B ESC, 378-2569 (Chemistry); Donald L. Robertson, 659 WIDB, 378-7018 (Biochemistry)

Faculty/Specialties

Professors

- Bills, James L. (1963) Ph.D., Massachusetts Institute of Technology, 1963. Inorganic Chemistry.
- Bradshaw, Jerald S. (1966) Ph.D., University of California, Los Angeles, 1963. Organic Chemistry.
- Butler, Eliot A. (1956) Ph.D., California Institute of Technology, 1956. Analytical Chemistry.
- Cluff, Coran L. (1960) Ph.D., University of Michigan, Ann Arbor, 1961. Inorganic Chemistry.
- Dalley, Nelson Kent (1968) Ph.D., University of Texas, Austin, 1968. Analytical Chemistry.
- Eatough, Delbert J. (1971) Ph.D., Brigham Young University, 1967. Physical Chemistry.
- Grant, David M. (1986)—Joint Appointment with the University of Utah Ph.D., University of Utah, 1958. Physical Chemistry.
- Hansen, Lee Duane (1972) Ph.D., Brigham Young University, 1965. Inorganic Chemistry.
- Hawkins, Richard T. (1959) Ph.D., University of Illinois, 1959. Organic Chemistry.
- Izatt, Reed M. (1956) Ph.D., Pennsylvania State University, 1954. Inorganic Chemistry.
- Lee, Milton L. (1976) Ph.D., Indiana University, 1975. Analytical Chemistry.
- Mangelson, Nolan F. (1969) Ph.D., University of California, Berkeley, 1967. Physical Chemistry.
- Mangum, John Harvey (1963) Ph.D., University of Washington, 1963. Biochemistry.
- Nordmeyer, Francis R. (1972) Ph.D., Stanford University, 1967. Inorganic Chemistry.
- Ott, J. Bevan (1960) Ph.D., University of California, Berkeley, 1959. Physical Chemistry.
- Owen, Noel L. (1986) Ph.D., Cambridge University, 1964; D.Sc., University of Wales, 1983. Physical Chemistry.
- Paul, Edward G. (1965) Ph.D., University of Utah, 1962. Organic Chemistry.
- Pugmire, Ronald J. (1986)—Joint Appointment with the University of Utah Ph.D., University of Utah, 1966. Physical Chemistry.
- Robins, Morris J. (1986) Ph.D., Arizona State University, 1965. Organic Chemistry.

- Smith, Marvin A. (1966) Ph.D., University of Wisconsin, Madison, 1964. Biochemistry.
- Snow, Richard L. (1957) Ph.D., University of Utah, 1957. Physical Chemistry.
- Thorne, James M. (1966) Ph.D., University of California, Berkeley, 1966. Physical Chemistry.
- Vernon, Leo P. (1970) Ph.D., Iowa State University of Science and Technology, 1951. Biochemistry.
- Watt, Gerald D. (1989) Ph.D., Brigham Young University, 1966. Inorganic Chemistry.
- Wilson, Byron J. (1965) Ph.D., University of Washington, 1961. Inorganic Chemistry.
- Woolley, Earl M. (1970) Ph.D., Brigham Young University, 1969. Analytical Physical Chemistry.

Associate Professors

- Boerio-Goates, Juliana (1981) Ph.D., University of Michigan, Ann Arbor, 1979. Physical Chemistry.
- Farnsworth, Paul B. (1981) Ph.D., University of Wisconsin, Madison, 1981. Analytical Chemistry.
- Goates, Steven R. (1981) Ph.D., University of Michigan, Ann Arbor, 1981. Analytical Chemistry.
- Lamb, John D. (1985) Ph.D., Brigham Young University, 1978. Inorganic Chemistry.
- Robertson, Donald Lee (1980) Ph.D., Washington University, 1976. Biochemistry.
- Zimmerman, S. Scott (1978) Ph.D., Florida State University, 1973. Biochemistry.

Assistant Professors

- Fleming, Steven A. (1985) Ph.D., University of Wisconsin, Madison, 1984. Organic Chemistry.
- Rossiter, Bryant E. (1985) Ph.D., Stanford University, 1981. Organic Chemistry.
- Simmons, Daniel L. (1989) Ph.D., University of Wisconsin, Madison, 1986. Biochemistry.

Graduate Programs and Degrees

- Chemistry (M.S.)
- Chemistry (Ph.D.)
- Biochemistry (M.S.)
- Biochemistry (Ph.D.)

Areas of Emphasis

Analytical chemistry, inorganic chemistry, organic chemistry, physical chemistry.

Graduate degrees in biochemistry are administered by the biochemistry faculty of the Chemistry Department. Qualified faculty in other departments may (with approval) become active members of the graduate section of biochemistry and may serve as members of graduate advisory committees.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

All graduate programs in chemistry and biochemistry have these features in common:

Admission and Entry

- I. Application requirements:

- A. Deadlines: Application file complete by February 15 for fall semester, August 15 for winter semester. International applications should be received by February 15 for fall semester, June 30 for winter semester.

B. Entrance examinations:

1. GRE (recommended). A prospective graduate student who chooses to submit GRE scores may find his or her application strengthened thereby (General: Q/V/A. Subject: Advanced chemistry or student's undergraduate major).
2. Departmental examinations. Written examinations of a student's undergraduate preparation in chemistry are given during the week preceding the first semester of enrollment. Deficiencies may be removed by repeating a failed examination or (with departmental approval) by taking specified undergraduate courses (with a grade of B [3.0] or better).
- II. Entry time: Fall semester entrance is strongly recommended. Limited admissions will be made for entry in winter semester and spring and summer terms if space is available.
- III. Teaching: The Chemistry Department relies on its graduate students to fill many assignments in laboratory and recitation instruction. Unless excused by the faculty, graduate students are expected to teach a cumulative total of at least two semesters at 20 hours a week during residency toward the doctoral degree. Master's degree candidates are expected to teach half this amount.

Chemistry (M.S.)

Admission and Entry

- I. Application requirements: See above.
- II. Prerequisite:
 - A. Baccalaureate degree in chemistry, or equivalent.
 - B. Proficiency in French, German, Japanese, or Russian; in mathematics beyond calculus; or in computer science.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Chem. 699R).
- II. Required courses: Chem. 594R (every semester in residence), 699R; other courses as specified by committee.
- III. Minor: Any approved minor.
- IV. Annual progress review and/or examination.
- V. Thesis.
- VI. Examination: Final oral examination consisting of two parts:
 - A. Public presentation of original research described in thesis.
 - B. Comprehensive examination on course work, research, and thesis.

Biochemistry (M.S.)

Admission and Entry

- I. Application requirements: See above.

- II. Prerequisite: Baccalaureate degree in physical, biological, or agricultural sciences from an accredited institution; applicants with degrees in fields other than chemistry should have successfully completed one-year courses in general, organic, and physical chemistry.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Chem. 699R).
- II. Required courses: Chem. 585R and 594R (every semester in residence), 582, 584, 699R.
- III. Minors permissible: Any established minor in the physical, biological, agricultural, or food sciences, or any combination thereof.
- IV. Annual progress review and/or examination.
- V. Thesis.
- VI. Examinations: Final oral examination and defense of thesis consisting of two parts:
 - A. Public presentation of original research described in thesis.
 - B. Comprehensive examination on course work, research, and thesis.

Chemistry (Ph.D.)

Admission and Entry

- I. Application requirements: See above.
- II. Prerequisite:
 - A. Baccalaureate degree in chemistry, or equivalent.
 - B. Proficiency in French, German, Japanese, or Russian; in mathematics beyond calculus; or in computer science.

Requirements for Degree (all to be approved by advisory committee)

- I. Credit hours (54): Minimum 36 course work hours plus 18 dissertation hours (Chem. 799R). With departmental approval, some credit from an M.S. degree may be applied toward this requirement.
- II. Required courses: Chem. 594R (every semester in residence), 799R; other courses as specified by committee.
- III. Research.
- IV. Annual progress review and/or examination.
- V. Language/skill requirement: There are several options for fulfilling the language/skill requirement. The options include speaking or reading ability in foreign languages, technical skills in mathematics, computer science or statistics, or a combination of these abilities and skills at the undergraduate level. Many students entering the chemistry graduate program will already have met much of this requirement with their baccalaureate training. Consult the Chemistry Department for more information about specific chemistry requirements. The graduate student and graduate advisor select the specific option to be used in each case.
- VI. Minor: Any approved minor.
- VII. Dissertation.
- VIII. Examinations: Oral examination on the dissertation consisting of two parts:
 - A. Public presentation of original research described in dissertation.

- B. Oral examination, primarily on dissertation.

Biochemistry (Ph.D.)

Admission and Entry and Requirements for Degree

Same as for doctor of philosophy degree in chemistry, with the following exceptions:

- I. Prerequisite: Baccalaureate degree in physical, biological, or agricultural sciences from an accredited college or university. Those with baccalaureate degrees in fields other than chemistry should have successfully completed one-year courses in general, organic, and physical chemistry.
- II. Oral proposition examination, approved by advisory committee.
- III. Required courses: Chem. 585R and 594R (every semester in residence); 582, 584.
- IV. Minor: Any established minor in the physical, biological, agricultural, or food sciences, or any combination thereof.

Chemistry Graduate Courses

501. Chemical Handling and Safe Laboratory Practices. (0.5)

Survey of appropriate methods in handling hazardous materials and disposing of waste. Legal rights and requirements. Safety in chemistry laboratory work.

514. Inorganic Chemistry. (3) W

Prerequisite: Chem. 462 or 468.

In-depth treatment of theoretical concepts in inorganic chemistry and the descriptive chemistry of some of the elements.

518. Inorganic Synthesis. (2) On dem.

Prerequisite: Chem. 501 or concurrent registration; 514.

Syntheses that demonstrate a variety of techniques and a range of inorganic materials.

522. Chemical Instrumentation. (3) W, Sp

Prerequisite: Chem. 227.

Introduction to analog and digital circuits, including computer architecture; provides background for computer control of chemical instrumentation and automated data collection.

523. Instrumental Analysis. (3) F

Prerequisite: Chem. 464, 501, or concurrent registration.

Modern instrumental methods and basic principles of instrumentation. Laboratory experience with a variety of instruments.

524. Analytical Chemistry. (2) W alt. yr.

Prerequisite: Chem. 523.

Advanced theory of measurements and techniques in chemical analysis.

552, 553. Advanced Organic Chemistry. (3) F, W

Prerequisite: Chem. 455.

Application of theoretical and practical foundations of organic chemistry to the study of structure and reactivity of organic molecules. Mechanisms and applications of many important organic reactions.

558. Organic Synthesis. (3) On dem.

Prerequisite: Chem. 552.

Laboratory preparations illustrating syntheses, emphasizing newer developments in strategy and methods.

561. Chemical Thermodynamics. (3) F

Prerequisite: Chem. 462.

Development of the principles of chemical thermodynamics, including laws, pure materials, mixtures, equilibria, and elementary statistical mechanics.

563. Reaction Kinetics. (3) W alt. yr.

Prerequisite: Chem. 462.

Theoretical aspects of chemical kinetics in the gas phase and in solution. Rates and mechanisms in solution, rapid reactions, and other topics.

564. Nuclear Chemistry and Radiochemistry. (2-3) W alt. yr.

Prerequisite: Chem. 462.

Introduction to nuclear structure, radioactivity, nuclear spectroscopy, and nuclear reactions, emphasizing applications in chemistry.

565. Introduction to Quantum Chemistry. (3) F

Prerequisite: Chem. 462.

Introduction to physical and mathematical aspects of quantum theory, emphasizing application of the Schrödinger wave equation to chemical systems.

581. Biochemistry. (4) F, W, Sp, Su

Prerequisite: Chem. 353 or 354 or equivalent.

Molecular components of cells, chemical structure and function, enzymes, metabolic transformations, photosynthesis, replication and transcription, protein synthesis. For chemistry majors or students in any of the biological sciences who contemplate pursuing advanced degrees, including medicine.

582. Advanced Biochemistry. (3) W

Prerequisite: Chem. 581.

Intensive course emphasizing both chemical and biological aspects of biochemistry, bioenergetics, enzymes, metabolic regulation, structure, and function of nucleic acids.

584. Biochemistry Laboratory. (2) W

Prerequisite: Chem. 581.

Modern research instrumentation and current biochemical research procedures. Enzyme isolation and characterization, protein sequencing, nucleic acid manipulations.

585R. Biochemistry Seminar. (0.5-1) F, W

Current topics discussed by guests, faculty, and graduate students. Required of graduate students in biochemistry each semester in residence.

586. Recombinant DNA. (2) W

Prerequisite: Chem. 581.

Laboratory course covering major techniques involved in isolation, amplification, and cloning of recombinant DNA. Variety of cloning systems and methods of identification introduced.

594R. General Seminar. (0.5) F, W

Research topics presented by faculty and visiting scientists. Required every semester in residence.

598R. Special Problems. (1-6) F, W, Sp, Su

Prerequisite: Chem. 501 or concurrent registration and consent of instructor.

Undergraduate research experience emphasizing student development.

619R. Advanced Topics in Inorganic Chemistry. (3) F

Prerequisite: Chem. 514.

The following topics are rotated:

Chemistry of the Main Group Elements. F

Chemistry of the Transition Elements. Alt. yr.

629R. Advanced Topics in Analytical Chemistry. (3) W

Prerequisite: Chem. 524.

The following topics are rotated:

Separation Methods of Analysis. W

Spectroscopic Methods of Analysis. Alt. yr.

659R. Advanced Topics in Organic Chemistry. (3)

Prerequisite: Chem. 553.

The following topics are rotated:

Mechanisms of Reactions. F alt. yr.

Organic Heterocycles. W alt. yr.

Organometallic Chemistry. W alt. yr.

669R. Advanced Topics in Physical Chemistry. (2-3)

Prerequisite: Chem. 561 and/or 565.

The following topics are rotated:

Advanced Chemical Thermodynamics. W alt. yr.

Quantum Chemistry. Every 3rd yr. on dem.

689R. Advanced Topics in Biochemistry. (1-3)

Prerequisite: Chem. 582.

The following topics are rotated:

Biomembranes and Bioenergetics. W alt. yr.

Metabolic Integration. F alt. yr.

Proteins and Enzymes. W alt. yr.

697R. Master's Candidate Research. (1-6) F, W, Sp, Su

Prerequisite: Chem. 501 or concurrent registration.

699R. Master's Thesis. (1-9) F, W, Sp, Su**719R. Selected Topics in Inorganic Chemistry.** (1-3) On dem.

Subjects that may be offered include:

Bioinorganic Chemistry

Coordination Chemistry

Environmental Chemistry

729R. Selected Topics in Analytical Chemistry. (1-3) On dem.

Subjects that may be offered include:

Atomic Spectroscopy

Chromatography

Electrochemical Methods of Analysis

Nonlinear Molecular Spectroscopy

X-Ray Structure Analysis

759R. Selected Topics in Organic Chemistry. (1-3) On dem.

Subjects that may be offered include:

Medicinal Chemistry

Natural Products

Organic Photochemistry

Organic Separations

Spectroscopic Identification

Stereoselective Synthesis

Synthetic Polymers

Clothing and Textiles

769R. Selected Topics in Physical Chemistry. (1-3) On dem.

Subjects that may be offered include:
Advanced Group Theory
Advanced Techniques in Magnetic Resonance
Atmospheric Chemistry.
Calorimetry
Molecular Structure and Spectroscopy
Solid-State Chemistry
Statistical Mechanics

789R. Selected Topics in Biochemistry. (1-3) On dem.

Subjects that may be offered include:
Biochemistry of Retroviruses
Biologically Active Peptides
Biopolymer Conformational Analysis
Gene Expression in Higher Plants
Metabolism
Molecular Biology of Cancer
Transmembrane Signalling

797R. Doctoral Candidate Research. (1-9) F, W, Sp, Su Prerequisite: Chem. 501 or concurrent registration.

799R. Doctoral Dissertation. (1-9) F, W, Sp, Su

Clothing and Textiles

Chair: Marvin C. J. Kuchar, 3256 SFLC, 378-7175

The Department of Clothing and Textiles does not offer a graduate degree but conducts classes for students who have completed the baccalaureate degree and are seeking additional practical experience in the field. Refer to the BYU General Catalogue for faculty listings. The following courses are available:

520R. Workshop in Clothing and Textiles. (1-3) On dem. Prerequisite: consent of instructor.

545. Period Pattern Making. (3)

Prerequisite: CITx. 145, 330, and consent of instructor.

Applying costume history and pattern making to period fashions. Hands-on experience in actual costume construction for theatre productions.

595R. Special Topics in Clothing and Textiles. (1-3) Prerequisite: 15 semester hours in clothing and textiles and consent of instructor.

599R. Merchandising Internship. (3)

Prerequisite: CITx. 110, 255 or 272, 260, 372, 473, Acc. 200, BusM. 340, 456, Comms. 101, Econ. 110, OrgB. 320, and departmental approval.

15-week full-time work experience spent in fulfilling specific training assignments. Recommended elective for students in fashion merchandising.

Design prerequisite: CITx. 260, 330, 365, 435, 450, and departmental approval.

Communications internship prerequisite: CITx. 269, 300, 490, and departmental approval.

In-shop management internship prerequisite: CITx. 395 and departmental approval.

Communications

Chair: David P. Forsyth, E-509 HFAC, 378-2077

Graduate Coordinator: Ralph D. Barney, F-467 HFAC, 378-3250

Faculty/Specialties

Professors

Barney, Ralph D. (1971) Ph.D., University of Missouri, Columbia, 1971. Media Ethics, International Communication, Media and Society.
Beckham, Raymond E. (1949) Ph.D., Southern Illinois University, 1972. Public Relations.
Burnett, M. Dallas (1958) Ph.D., Northwestern University, 1967. Communications Law.
Gibb, J. Douglas (1969) Ph.D., Wayne State University, 1966. Human Communication Processes.
Goodman, R. Irwin (1962) Ed.D., Indiana University East, 1969. Media Evaluation.
Tarbox, Norman C. (1960) Ph.D., University of Utah, 1979. Broadcasting History.
Whiting, Gordon C. (1973) Ph.D., Michigan State University, 1967. Assessment of Media Quality.

Associate Professors

Egan, Kathryn S. (1986) Ph.D., University of Southern California, 1972. Broadcast Women Research.
Gale, Larrie Eldon (1978) Ph.D., University of Utah, 1973. Message Design, International Communication.
Hainsworth, Brad E. (1984) Ph.D., University of Utah, 1968. Issues Management.
Kagel, Richard I. (1973) Ph.D., Columbia Pacific University, 1980. Advertising Research.
Nelson, Jack Adolph (1977) Ph.D., University of Missouri, Columbia, 1971. Magazines, Journalism History.
Porter, William C. (1972) Ed.D., University of Oklahoma, 1986. New Technologies, Writing Theory.
Pratte, Paul Alfred (1984) Ph.D., University of Hawaii, 1976. Journalism History.

Assistant Professors

Knutson, Margaret (1986) Ph.D., University of Utah, 1989. Mass Communication Ethics and History.
Wilson, Laurie J. (1989) Ph.D., American University, 1988. International Communications.

Graduate Program and Degree

Communications (M.A.)

Area of Emphasis

Mass communication theory and research.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Communications (M.A.)

Admission and Entry

I. Application requirements:

- A. Deadline: University deadline applies.
- B. Entrance examination: Miller Analogies Test.

- C. GPA: Minimum 3.0 GPA for last 60 semester hours.

II. Prerequisite:

- A. Baccalaureate degree.
 B. If undergraduate preparation in communications is not adequate, the advisory committee and department graduate coordinator or chair will require certain courses to satisfy the deficiency.
 C. Background in research and statistics; prerequisite course required.
 D. Professional experience in communications is desirable.
 E. Professional competence in written and spoken English is necessary.

III. Entry time: Fall semester.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Comms. 699R).
 II. Required courses: Comms. 609, 610, 611, 612R, 616 (11 hours), 699R (6 hours); two courses from: 613, 615, 617 or an approved minor.
 III. Electives: Determined in consultation with sponsor/advisor and committee.
 IV. Thesis.
 V. Examinations:
 A. Written comprehensive examination.
 B. Final oral examination and defense of thesis.

Communications Minor

Consult the department chair or graduate coordinator regarding a recommended program of study.

Communications Graduate Courses

501. History of Mass Communications. (3)

Print, film, and broadcast communication media from their beginnings to the present; their roles as institutions in American society.

502. Electronic Media Criticism. (2)

Criticism of electronic media as systems and of their products and effects; critic's role and qualifications.

510. Mass Media Administration. (2)

Basic principles of management as they relate to organizing and administering newspapers, magazines, radio stations, and television stations.

515. Broadcast Documentary Production. (3)

Prerequisite: Comms. 314, 316, 360.

In-depth reporting and presentation of news and public affairs information for miniseries, magazine formats, and documentary specials for radio and television.

521. Opinion Writing. (3)

Prerequisite: Comms. 312 or 316.

Function of editorials, columns, commentaries, and reviews in the mass media.

528. Magazine Editing and Publishing. (2)

Prerequisite: Comms. 312.

Layout and design for magazines and business publications. Contemporary practices in content and production.

538. Impact of New Media Technologies. (3)

Impact of computerized information delivery on traditional mass media and on society. Existing electronic systems.

550. Communicating Values Through Media. (2)

Variables influencing development of values through mediated messages.

555. Media Evaluation. (2)

Prerequisite: Comms. 291.

Techniques used to evaluate films, TV, or audio programs before and after production.

556. Advanced Program Development and Production. (2)

Prerequisite: Comms. 346 and 355, or consent of instructor; concurrent registration in Comms. 396R.

Broadcast producing; observing professional standards.

580. Comparative Mass Media Systems. (3)

Comparison of national media systems; normative theories of media organization and control.

581. International Communication. (3)

International information flow; information flow and foreign policy; international regulation; cultural imperialism; intercultural interaction.

582. Communications and National Development. (3)

Role of telecommunication, mass, and interpersonal communication in national development, focusing on the Third World; technology, policy and methods, problems, issues.

590R. Selected Readings and Projects. (1-2)

Independent research and study outside usual thesis work.

599R. Internship. (2-6)

Prerequisite: approval of faculty advisor and clearance by Communications Department.

609. Proseminar. (1)

Introduction to graduate study and mass communication theory.

610. Studies in Communication Theory. (3)

Nature and content of contemporary communication theory.

611. Research Methods in Communication. (3)

Prerequisite: Stat. 222 or equivalent.

Major methods of research used in communication; thesis writing and research.

612R. Research Practicum. (1)

Practical experience in research under direction of individual faculty.

613. Literature of Communications. (2)

Literature that contributes to understanding and functioning of communications processes.

615. Public Opinion and Propaganda. (3)

Concepts of public opinion and propaganda, their links to interpersonal and societal processes; mass media.

616. Seminar in Mass Media and Society. (3)

Mass media's roles in major social settings, historical development of open-system societies, contemporary ethical dilemmas, effects of new media.

617. Mass Communications and Government. (3)

Contemporary relationship between government and the mass media; philosophical and historical basis for regulation in light of constitutional guarantees.

690. Seminar in Communications. (1)

691R. Special Studies in Communications. (1-3)

Individual work on approved problems not leading to a thesis. Projects must be approved before registration.

695R. Topical Seminar. (1-3)

699R. Master's Thesis. (6V)

Computer Science

Chair: Bill Hays, 3361 TMCB, 378-3027

Graduate Coordinator: Larry C. Christensen, 3366 TMCB, 378-5670

Faculty/Specialties

Professors

Burton, Robert C. (1964) Ph.D., University of North Carolina, 1963. Computer-aided Design.

Burton, Robert Preece (1974) Ph.D., University of Utah, 1973. Hyperdimensional Graphics.

Campbell, Douglas M. (1971) Ph.D., University of North Carolina, 1971. Complexity Theory.

Cornell, Aurel (1980) Ph.D., Polytechnic Institute of Timisoara (Rumania), 1971. Distributed/Concurrent Programming.

Crandall, Vern J. (1968) Ph.D., University of Washington, 1972. System Analysis, Design, Implementation, Testing.

Eembley, David W. (1982) Ph.D., University of Illinois, 1976. Database Systems, Software Engineering.

Hays, Bill (1970) Ph.D., Northwestern University, 1970. Database Systems, Compiler Development, Programming Languages.

Higgins, John C. (1961) Ph.D., University of California, Davis, 1966. Theoretical Foundations.

Ivie, Evan Leon (1979) Ph.D., Massachusetts Institute of Technology, 1966. Operating Systems.

Norman, Theodore A. (1970) Ph.D., Washington State University, 1970. Systems Simulation.

Stokes, Gordon E. (1969) Ed.D., Brigham Young University, 1981. Database Management, Human Factors, Intelligent CBI Systems.

Associate Professors

Barrett, William A. (1986) Ph.D., University of Utah, 1978. Computer Vision, Image Processing, Pattern Recognition.

Beus, H. Lynn (1971) Ph.D., Case Western Reserve University, 1967. Artificial Intelligence, Pattern Recognition.

Christensen, Larry C. (1983) Ed.D., Brigham Young University, 1981. Expert Systems, Computer-assisted Instruction, Software Engineering.

Olsen, Dan R. (1985) Ph.D., University of Pennsylvania, 1981. Human-Computer Interfaces, Programming Environments, Computer Graphics.

Woodfield, Scott N. (1985) Ph.D., Purdue University, 1980. Software Design, Reusability, Software Engineering.

Assistant Professor

Martinez, Tony (1987) Ph.D., University of California, Los Angeles, 1986. Neural Networks, Parallel Processing.

Graduate Programs and Degrees

Computer Science (M.S.)

Computer Science (Ph.D.)

Areas of Emphasis

See faculty specialties.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Computer Science (M.S.)

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examinations:

1. General GRE; score subject to review.

2. TOEFL examination for those whose native language is not English.

II. Prerequisite: Baccalaureate degree in computer science or equivalent course work in related undergraduate programs.

Requirements for Degree

I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (CS 699R).

II. Required courses: Determined in consultation with advisory committee. (No graduate credit is given for courses numbered less than 400 or for 400-level courses required of undergraduate majors).

III. Thesis: Must have departmental acceptance of a thesis proposal before beginning thesis research.

IV. Examinations: Final oral examination and defense of thesis.

Computer Science (Ph.D.)

Admission and Entry

I. Application requirements:

A. Deadlines: March 15 for fall semester; June 15 for winter semester.

B. Entrance examinations:

1. General and advanced computer science GRE.

2. TOEFL examination for those whose native language is not English.

C. GPA: 3.25 or higher in the last 60 semester hours of college work.

II. Prerequisite: Baccalaureate degree in computer science or equivalent (students with undergraduate deficiencies should enroll in the M.S. program).

III. Entry times: Fall and winter semesters.

Requirements for Degree

- I. Credit hours (72): Minimum 54 course work hours plus 18 hours of dissertation research.
- II. Skill/language requirement: None of the courses taken to fill this requirement can count toward the 60-hour course work requirement; however, undergraduate credit may be used to fulfill this requirement. The only allowable languages are French, German, Russian, or Japanese. The student may choose one of the following options:
 - A. Complete 22 hours of language courses with an average grade of B (3.0) in one language.
 - B. Pass a language department exam verifying an in-depth reading and speaking knowledge of one language.
 - C. Complete at least 9 hours from IS 564, 661, Stat. 361, 501, 502, plus 13 hours of mathematics and statistics beyond college trigonometry.
- III. Dissertation.
- IV. Examinations:
 - A. Qualifying examinations: A series of examinations demonstrating broad proficiency in computer science. Qualifying exams must be taken no later than one year from the student's admittance to the program. See department for details.
 - B. Oral defense of dissertation.
- V. Residency: A student must spend at least the last three consecutive semesters as a full-time resident (combined spring and summer terms count as one semester).
- VI. Teaching: All students must teach at least one semester.

Program and Degree Resources

Computer-based Instruction Laboratory
 Operating Systems Laboratories
 Computer Graphics Laboratories
 Artificial Intelligence and Expert Systems Laboratories
 Computer Vision Laboratory
 Interactive Software Systems Laboratory
 Networking/Communications Laboratory

Computer Science Graduate Courses

501R. Special Topics in Computer Science. (1-3) F, W, Sp, Su

Prerequisite: consent of instructor.

Special subjects as announced before each semester.

505. Computer-aided Circuit Design. (3) W

Prerequisite: CS 351, 380.

Chip simulation algorithms, schematic capture algorithms, and algorithms for solving very large sets of stiff, coupled, nonlinear equations, including Gear algorithms, relaxation algorithms, sparse matrix methods.

510. Formal Languages and Syntactic Analysis. (3) F, Alt. Sp or Su

Prerequisite: CS 431 or consent of instructor.

Definition of formal grammars and algorithms for syntactic analysis.

512. Analysis of Algorithms. (3) W

Prerequisite: CS 352 or consent of instructor.

Survey of important algorithms. Connections to theoretical computer science and the analysis of algorithms.

521. Pattern Recognition. (3) W

Prerequisite: CS 351 or consent of instructor.

Using computers to analyze, recognize, or describe complex objects such as handwriting, pictures, voice, or experimental data. Emphasis on handwriting.

525. Software Creation. (3) F

Prerequisite: CS 327.

Creating large software systems: requirements, specification, rapid prototyping, high-level design, low-level design, coding.

527. Quality Management. (3) Alt. yr.

Prerequisite: CS 327, 425.

Principles associated with management of large software systems. Controlling development, cost and time estimations, metrics, team structures, configuration management, and quality assurance.

531. Compiler Theory and Design. (3) Alt. yr.

Prerequisite: CS 431.

Theory and design of compilers and interpreters, including syntax-directed compilers and metacompilers.

532. Advanced Programming Languages and Models. (3) Alt. yr.

Prerequisite: CS 431.

Definitions and implementation techniques for functional languages, logic languages, and object-oriented languages. Interactive languages and interactive programming environments.

535. Human-Computer Interaction. (3) F

Prerequisite: CS 344, 431.

Human/machine interfaces for hardware/software integration. Psychological principles of computer interfacing. Human engineering, ergonomics, software design principles for user-friendly applications.

544. Advanced Operating Systems. (3) F, Alt. Sp or Su

Prerequisite: CS 444.

Advanced operating system concepts and design techniques, including concurrency, distributed systems, networking, synchronization, multitasking, etc.

545. Process Control Systems. (3) W

Prerequisite: CS 444.

Concurrent and distributed real-time operating systems and programming environments for industrial automation.

550. Introduction to Computer Vision. (3) F

Prerequisite: CS 330 and consent of instructor.

Active research affecting disciplines such as medical imaging, earth resource planning, robotics.

551. Relational Database Theory 1. (3) F, Alt. Sp or Su

Prerequisite: CS 451.

Relational algebra, data dependencies, normalization, and design theory.

555. Advanced Computer Graphics 1. (3) W

Prerequisite: CS 455 or consent of instructor.

Advanced interactive computer graphics systems programming and architecture.

556. Interactive Software Systems. (3) W

Prerequisite: CS 330, 455.

Techniques to implement human and computer interfaces. Primitive interactive techniques. Grammar, automata, procedure, object-based dialogue descriptions. Tools for automatically generating and evaluating user interfaces. Screen layout; data presentation tools.

560. Computer Networks. (3) W

Prerequisite: CS 460, Stat. 321.

Computer networking, software architecture, organization, protocols, routing, global networks, local networks, internetworking, standards, and applications.

561. Theoretical Foundations of Computer Science. (3) W, Su

Prerequisite: CS 352 or consent of instructor.

Formal languages, automata theory, sequential machines, enumerability, computability, and undecidability.

562. Digital Communication Systems. (3) Alt. yr.

Prerequisite: CS 460.

Data communication technology and systems; architecture, transmission, switching, media, channel utilization, satellites, topology, throughput, reliability, and applications.

565. Data Security. (3) W

Prerequisite: CS 404. Recommended: CS 451, 560.

Data security problems and solutions. Protection of stored or transported data. Data security principles. Hardware and software systems; mathematical, technical, and legal considerations.

571. Discrete Systems Simulation. (3) Alt. yr.

Prerequisite: CS 232, 431, or consent of instructor.

Computer simulation using resources, policies, and processes. Models built and analyzed.

575. Expert Systems Design. (3) W

Prerequisite: CS 370 or consent of instructor.

Knowledge-based systems, fundamentals of knowledge engineering, rule-based systems, tools for expert system development.

576. Intelligent Tutoring. (3) Alt. Sp or Su

Prerequisite: CS 575 or consent of instructor.

Taxonomy of knowledge-based computer-assisted instruction; design and evaluation of intelligent tutoring models.

578. Neural Networks and Connectionist Computing. (3) F

Prerequisite: CS 380, Math. 113.

Neurally inspired computer architectures and methods of computation using massively parallel networks.

581. Advanced Computer Architecture. (3)

Prerequisite: CS 380, 444. Recommended: CS 480.

Designing innovative and relevant machine organizations.

588. Non-von Neumann Computing and Massively Parallel Architecture. (3) W

Prerequisite: CS 380.

Novel and promising computing mechanisms and architectures that depart from traditional von Neumann

methods.

598R. Special Projects. (1-3) F, W, Sp, Su

Prerequisite: consent of instructor.

627. Theoretical Foundations of Software Engineering. (3) Alt. yr.

Prerequisite: CS 525.

Introduction to theory aspects of computer science that pertain to software engineering (proof of correctness, conceptual models).

644. Operating Systems Research. (3) Alt. yr. W or Sp

Prerequisite: CS 544.

Latest research and current literature in operating systems.

650. Computer Vision 2. (3) W

Prerequisite: CS 550.

Advanced topics in computer vision: segmentation, boundary tracking, image representation and description; design and application of computer vision systems using prior knowledge and visual models.

651. Relational Database Theory 2. (3) Alt. yr.

Prerequisite: CS 551.

Relational calculus, query languages and relational completeness, query optimization, topics of current interest.

655. Advanced Computer Graphics II. (3) F

Prerequisite: CS 455 and 555 or consent of instructor.

Continuation of CS 555. Advanced graphics techniques, systems, and standards.

660. Distributed Systems. (3) Alt. yr.

Prerequisite: CS 344, 451, 560, 562.

Analysis and design of distributed systems architecture. Operating system, database, and computer network considerations. Synthesis techniques and examples.

678. Advanced Topics in Non-von Neumann Computing. (3) Alt. yr.

Prerequisite: CS 578, 588.

Advanced research topics in areas of non-von Neumann computing, including neural, connectionist, and massively parallel systems. Course tailored toward students' research goals.

699R. Master's Thesis. (Arr.) F, W, Sp, Su

Prerequisite: consent of committee chair.

751R. Advanced Topics in Database Systems. (3) Alt. Sp

Prerequisite: CS 651.

799R. Doctoral Dissertation. (1-9 V) F, W, Sp, Su

Prerequisite: consent of committee chair.

Design

Chair: W. Douglas Stout, 360-B BRMB, 378-5062

The Department of Design does not offer a graduate degree but offers the following graduate courses. Refer to the BYU General Catalogue for faculty listings.

Design Graduate Courses

610R. Advanced Problems in Design. (1-8)

Prerequisite: admission by portfolio.

Individual research and project development.

630R. Advanced Problems in Industrial Design. (1-8)

Prerequisite: admission by portfolio.

Individual research and project development.

631R. Advanced Presentation Methods for Industrial Design. (1-8)

Prerequisite: admission by portfolio.

Individual research and project development.

640R. Advanced Problems in Graphic Design. (1-5)

Prerequisite: admission by portfolio.

Individual research and project development.

644R. Advanced Problems in Illustration. (1-5)

Prerequisite: admission by portfolio.

Individual research and project development.

Economics

Chair: Rulon D. Pope, 130 FOB, 378-2859

Graduate Coordinator: Sydney C. James, 130 FOB, 378-2362

Faculty/Specialties

Professors

Butler, Richard J. (1982) Ph.D., University of Chicago, 1979.
Labor Economics, Quantitative Economics, Economic Theory, Econometrics.

Gardner, B. Delworth (1986) Ph.D., University of Chicago, 1960. Resource Economics, Agricultural Economics, Economic Theory, Economic Development.

James, Sydney C. (1983) Ph.D., Oregon State University, 1960. Farm and Ranch Management.

Jensen, Farrell E. (1982) Ph.D., Kansas State University, 1972. Agricultural Economics and Financial Economics.

Kearl, J. R. (1975) Ph.D., Massachusetts Institute of Technology, 1975. Law and Economics, Economic Theory, Trade Policy, Economics of Income and Wealth Distribution.

McDonald, James B. (1972) Ph.D., Purdue University, 1970. Econometrics, Quantitative Economics.

Park, William Laird (1977) Ph.D., Cornell University, 1963. Agricultural Economics, Dairy Economics.

Pope, Clayne L. (1970) Ph.D., University of Chicago, 1972. Economic History, Economic Theory.

Pope, Rulon D. (1982) Ph.D., University of California, Berkeley, 1976. Agricultural Economics, Microeconomic Theory.

Wimmer, Larry T. (1963) Ph.D., University of Chicago, 1968. Economic History, Economic Theory.

Associate Professors

Dutton, Dean S. (1968) Ph.D., Michigan State University, 1968. Monetary Theory, Economic Theory, International Monetary Theory.

Lambson, Val (1989) Ph.D., University of Rochester, 1983. Economic Theory, Industrial Organization and International Trade.

Pope, C. Arden, III (1984) Ph.D., Iowa State University, 1981. Natural Resource and Environmental Economics, Agricultural Economics, Economic Theory.

Ransom, Michael R. (1988) Ph.D., Princeton University, 1983. Labor Economics and Applied Econometrics.

Spencer, David E. (1986) Ph.D., Texas A&M University, 1974. Econometrics, Macroeconomics.

Assistant Professor

Manning, Richard L. (1989) Ph.D., University of Chicago, 1989. Industrial Organization and Applied Microeconomics.

Graduate Program and Degree

Applied Economics (M.S.)

Areas of Emphasis

Agricultural economics, economic history, economic theory, econometrics, labor economics, law and economics, macro-economics, mathematical economics, and natural resource economics.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Applied Economics (M.S.)

The master's degree program in applied economics provides an excellent background for students interested in positions with governments or business as professional economists. It also prepares students for further graduate work in economics (including agricultural economics), business, public policy, or related fields.

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examinations:

1. General GRE (Q, V, A): score subject to review.
2. TOEFL or Michigan tests in English for students whose native language is other than English.

II. Prerequisite:

A. Two semesters of intermediate economic theory: Econ. 380, 381.

B. Calculus through integration: Math. 112, 113; or Math. 119 or equivalent.

C. One semester of mathematical statistics: Stat. 321.

D. One semester of econometrics: Econ. 388 or equivalent.

E. One semester of mathematics for economists: Econ. 386 or equivalent.

Note: Students deficient in any of these areas may be admitted to the program on a provisional basis.

Requirements for Degree

I. Credit hours:

A. Thesis option: Minimum 24 hours of course work plus 6 thesis hours (Econ. 699R).

B. Nonthesis option: Minimum 30 hours of course work plus 3 project hours (Econ. 698R).

- ##### II. Required core courses:
- Econ. 580, 581, 582 or suitable approved policy course, 588 and 698R or 699R. (If any of these courses were completed as an undergraduate, the student will be expected to add the corresponding 600-level course where available.)

- III. Electives: Determined in consultation with advisory committee.

Note: A designated emphasis in agricultural economics is available on completion of an approved list of field courses in the economics of agricultural or related areas.

- IV. Thesis or project.

- V. Examinations: Final oral examination.

Economics Graduate Courses

580. Advanced Price Theory. (3)

Prerequisite: Econ. 380, 386 (or equivalents).
Individual behavior and markets.

581. Advanced Macroeconomics. (3)

Prerequisite: Econ. 380, 381, and 386.

Income, unemployment, and price-level analysis.

582. Welfare Economics. (3)

Prerequisite: Econ. 380, 386 (or equivalents).

General equilibrium theorems and considerations that must guide applied economic work and provide quantitative information on effects of alternative policy measures.

586. Mathematical Economics. (3)

Prerequisite: Econ. 380, 381, 386, or equivalent.

Mathematical modeling of economic behavior.

588. Econometrics. (3)

Prerequisite: Econ. 380, 381, 386, 388; Stat. 321; or consent of instructor. Computer use fee.

Theory and practice of economic measurement.

599R. Cooperative Education: Supervised Management and Training. (2-6V)

Prerequisite: Course work pertinent to proposed experience.

On-the-job experience. Improving ability to function in a particular phase of agribusiness management.

610. Advanced Market and Price Analysis. (3)

Prerequisite: Econ. 310, 380, or equivalent.

Economic principles, policies, and practices in the analysis of market structure and pricing; emphasis on agricultural industries.

613R. Topics in Economic Theory. (1-5V)

Prerequisite: Econ. 380, 381, and additional requirements as required by the topic.

Course is generally assigned 3 credit hours.

620. Advanced Agricultural Finance. (3)

Prerequisite: Econ. 380, 386, or equivalent.

Financial analysis; factors that affect the supply and demand for capital in agriculture.

621. Advanced Law and Economics. (3)

Prerequisite: Econ. 380.

Common law allocative mechanisms (contract, tort, and property law) as alternatives to collective intervention when markets fail; economic logic of law.

625. Applied Agricultural Production Economics. (3)

Prerequisite: Econ. 380, 386, or equivalent.

Economic principles and mathematical programming for analysis of producer behavior and solutions to agricultural production problems.

630. Advanced Economic Development. (3)

Prerequisite: Econ. 380 or equivalent.

Problems and processes of economic growth and development; emphasis on less-developed nations.

640. Advanced Economics and Natural Resources. (3)

Prerequisite: Econ. 380.

Economic theory applied to natural resources. Property rights, economic rent, common property situations, time and resource conversion and depletion, market failure, public choice theory, and rudimentary benefit/cost analysis.

653. Advanced Money and Banking. (3)

Prerequisite: Econ. 380, 381, or equivalent.

Economic principles and models applied to monetary analysis and policy and the banking structure.

658. Advanced International Trade. (3)

Prerequisite: Econ. 380, 381, 386 (or equivalents).

Theory of exchange, specialization, and trade, with respect to allocation problem when distinct economies interact.

659. Advanced International Monetary Theory. (3)

Prerequisite: Econ. 380, 381.

Monetary and macroeconomic aspects of international relations; short-run balance-of-payments, disequilibrium and adjustments.

660. Advanced Agricultural Policy. (3)

Prerequisite: Econ. 380 or equivalent.

Research methods and economic analysis of the development and implementation of agricultural policy.

663. Advanced Economics of the Labor Market. (3)

Prerequisite: Econ. 380, 386.

Economic incentives, policies, and problems affecting labor markets.

670. Advanced Experimental Economics. (3)

Prerequisite: Econ. 380.

Methods and findings in the analysis of experimental markets.

674. Advanced Topics in Economic History. (3)

Prerequisite: Econ. 380 and completion of or concurrent registration in Econ. 388.

Selected topics in economic history, emphasizing readings from its contemporary literature.

675. Advanced Public Finance. (3)

Prerequisite: Econ. 380.

Advanced theory of economic decision making in the public sector, including cost-benefit analysis and efficiency-equity issues of taxation and expenditure policies.

676. Advanced Industrial Organization. (3)

Prerequisite: Econ. 380, 386.

Economic analysis of market structures such as monopoly and oligopoly; evidence concerning U.S. industrial markets and pricing.

698R. Master's Project. (1-3V)

Prerequisite: graduate standing.

Scholarly research or development project that demonstrates student's ability to use and integrate economic concepts with real-world situations.

699R. Master's Thesis. (1-6V)

Education

Admission to Graduate Programs

Department requirements for admission to graduate programs in the College of Education vary somewhat, depending on major field of study. However, the general requirements described below apply to all students seeking admission to graduate programs.

Transfer and nondegree credit: No more than 10 semester hours of credit acquired at BYU in a nondegree status or transfer credit from another recognized graduate school may be included as part of the master's or doctoral programs.

Transfer and nondegree credit must be approved by the student's advisory committee.

Candidates for the master's degree must:

1. Have a baccalaureate degree.
2. Have a cumulative GPA of 3.0 in the most recent 60 semester hours of college credit.
3. Show acceptable scores on the Graduate Record Examination.
4. Have appropriate professional experience.
5. Graduate within five years following admission.

Candidates for the doctorate must:

1. Have a master's degree (required for most programs).
2. Have a cumulative GPA of 3.0 in the most recent 60 semester hours of college credit.
3. Show acceptable scores on the Graduate Record Examination.
4. Have appropriate professional experience.

For specific information regarding admission requirements, dates of application, entrance examination details, and residence requirements, refer to the department descriptions that follow or the handbook published by the College of Education, "Information for Graduate Students and Faculty."

Educational Leadership

Chair: Ivan D. Muse, 310 MCKB, 378-4291

Graduate Coordinator: Norman F. Hyatt, 310 MCKB, 378-3814

Faculty/Specialties

Professors

Andersen, Dan W., Dean (1980) Ph.D., University of Wisconsin, Madison, 1961. Administrative Behavior.
Garfield, Rulon Roy (1978) Ph.D., University of Utah, 1964. Finance, Politics, Business.
Hungerford, Curtiss R. (1977) Ph.D., University of Southern California, 1967. Higher Education.
Hyatt, Norman F. (1970) Ed.D., University of Oregon, 1964. Evaluation, Planning.
Muse, Ivan D. (1970) Ed.D., University of Utah, 1966. Leadership, Curriculum, Gifted and Talented.

Ovard, Glen F. (1956) Ed.D., Stanford University, 1959.

Principalship, Facilities.

Shute, R. Wayne (1974) Ed.D., University of Southern California, 1964. Instruction, Higher Education, Learning.

Van Alfen, Curtis N. (1967) Ed.D., University of Utah, 1967. Leadership, Higher Education, Change in Education.

Wasden, F. Del (1971) Ed.D., Brigham Young University, 1971. Law, Leadership.

Associate Professors

Butterfield, Dennie D. (1974) Ed.D., University of California, Los Angeles, 1972. Curriculum, Instruction.

Harms, Callis R. (1960) Ed.D., Arizona State University, 1961. Research, Curriculum.

Webb, Clark D. (1966) Ph.D., University of Texas, Austin, 1970. Instruction, Writing, Leadership.

Graduate Programs and Degrees

Educational Leadership (M.Ed.)

Educational Leadership (Ed.D.)

Educational Leadership (Ph.D.)

Areas of Emphasis

School Administration, Curriculum and Instruction, Higher Education.

Administrative/Supervisory Certification

Graduate programs in the Department of Educational Leadership are not designed to complete administrative/supervisory certification and endorsement requirements, but rather to prepare educational leaders with the necessary knowledge and skills for educational leadership. Students are advised to note the distinction as they plan for graduate study. Consult the department for information.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Educational Leadership (M.Ed.)

Admission and Entry

I. Application requirements:

A. Deadline: April 1 for summer term; May 1 for fall semester; September 1 for winter semester.

B. Entrance examinations:

1. GRE (recommended scores: verbal and quantitative, 900; analytical, 500).
2. Department may require additional examinations.

C. GPA: Minimum of 3.0 for last 60 hours.

II. Prerequisite:

A. Baccalaureate degree.

B. Curriculum and instruction or administrative leadership specialty candidates: Valid teaching credential and a minimum of one year's teaching experience.

III. Entry time: Summer preferred.

Requirements for Degree

I. Credit hours: 36.

- II. Required courses: Consult outline available in department office.
- III. Study list: Should be submitted by the end of the first semester.
- IV. Credit limitations: ELdr. 515R or extension credit will not be counted toward a degree program.
- V. Residence: At least one full-time registration (9 hours) must be taken on the BYU Provo campus.
- VI. Examinations: Final written and/or oral comprehensive examination covering course work.

Minimum registration: Following admission to the M.Ed. program, students will be expected to work continuously toward completion of all requirements for the degree. The university requires that students complete at least 6 semester hours of approved program credit during each academic year (September 1 to August 31).

Educational Leadership (Ed.D.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: University deadlines apply.
 - B. Entrance examination:
 - 1. GRE (recommended scores: verbal and quantitative, 1000; analytical, 500).
 - 2. Department may require additional examinations.
- II. Prerequisite:
 - A. Master's degree.
 - B. Three years of educational leadership experience in the public schools; current position of leadership related to the major and consistent with doctoral study, or a valid teaching credential and/or appropriate educational and professional experience; minimum of three years' professional experience in a leadership position related to the major.
- III. Entry time:
 - A. Full-time students, every semester.
 - B. Summer residency students, summer only.

Requirements for Degree

- I. Credit hours (90): Minimum of 78 course work hours plus 12 hours of dissertation (ELdr. 799R); minimum of 45 hours taken in the BYU doctoral program. Credit earned in a recognized advanced degree program such as a master's or educational specialist may apply.
- II. Required courses:
 - A. See program outline available in department office.
 - B. Course work in research statistics.
- III. Study list: Should be submitted by the end of the first semester.
- IV. Credit limitations: ELdr. 515R or extension credit will not be counted toward a degree program.
- V. Minor (optional): 18 hours in a department outside the College of Education.
- VI. Residence:
 - A. Full-time doctoral students: Two consecutive full-time registrations (at least 9 hours each) on the BYU Provo campus.

- B. Summer residency students: Three consecutive full-time summer terms (at least 8 hours each) on campus, intervening on-site course work, and supervised field experiences.

- C. Only 3 hours of dissertation credit may apply toward residency.

- VII. Dissertation: This must be a rigorous, independent, guided research project involving the identification and solution of a significant problem in educational leadership. Students should understand that the Ed.D. emphasizes the application of theoretical constructs to educational policies and practices. Dissertations should reflect this emphasis. The Ed.D. dissertation carries 12 credit hours and may not be undertaken until successful completion of the comprehensive examination and approval of the dissertation prospectus by the advisory committee and the department chair. The dissertation and prospectus defense are different in kind from course work per se; therefore, performance on these tasks may not correlate with performance in individual courses.

VIII. Examinations:

- A. Written and oral comprehensive examinations.
- B. Oral defense of dissertation.

Minimum registration: Following admission to the doctoral program, students will be expected to work continuously toward completion of all requirements for the degree. The university requires that students complete at least 6 hours of approved program credit during each academic year (September 1 to August 31).

Educational Leadership (Ph.D.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: January 15 for summer term entrance; April 1 for fall semester entrance; September 1 for winter semester entrance.
 - B. Entrance examinations:
 - 1. GRE (recommended scores: verbal and quantitative, 1100; analytical, 500).
 - 2. The department may require additional examinations.
- II. Prerequisite:
 - A. Master's degree.
 - B. Educational leadership emphasizing administration candidates: Minimum of three years' professional experience in leadership and/or administration consistent with the major area of study.
 - C. Educational leadership emphasizing curriculum and instruction candidates: Minimum of three years' professional experience consistent with major area of study.

Requirements for Degree

- I. Credit hours (96): Minimum of 78 hours beyond the baccalaureate degree including skill requirement, plus 18 hours of dissertation credit (ELdr. 799R); 12 hours outside the college. Prior credit earned in a recognized advanced degree program may apply on the recommendation of advisory committee.

- II. Required courses: Consult department for major core courses.
- III. Study list: Should be submitted by the end of the first semester.
- IV. Credit limitations: ELdr. 515R or extension courses are not accepted toward degree programs.
- V. Minor: 18 hours in a department outside the College of Education.
- VI. Residence: Two consecutive full-time semesters (9 hours each semester) on the BYU Provo campus.
- VII. Skill requirement: Consult department.
- VIII. Dissertation: A dissertation is required. The purpose of the Ph.D. is to expand, in creative ways, the theoretical knowledge base of the educational leadership field. The dissertation should reflect such emphasis. The dissertation carries 18 credit hours and presumes advanced research expertise. It may not be undertaken until successful completion of the comprehensive examination and approval of the dissertation prospectus by the student's advisory committee and department chair. The dissertation and prospectus are somewhat different in nature from course work per se; therefore, performance on these tasks may not correlate highly with performance in individual courses.
- IX. Examinations:
 - A. Written and oral comprehensive examination.
 - B. Oral defense of dissertation.

Minimum registration: Following admission to the doctoral program, students will be expected to work continuously toward completion of all requirements for the degree. The university requires that students complete at least 6 hours of approved program credit during each academic year (September 1 to August 31).

Educational Leadership Graduate Courses

Note: ELdr. 515R is for certification purposes only and is listed in the BYU General Catalogue.

- 516. Master's Orientation Seminar.** (2V) Su
Fundamental educational questions answered through interaction with faculty and other students.
- 517. Professional and Scholarly Writing in Education.** (2) F, W, Su
Refinement of skills for professional writing efforts, e.g., memoranda, reports, articles, theses, etc. Practice and corrective feedback.
- 531. Teaching and Learning: Research and Practice.** (3) W, Su
Teaching and learning from the perspectives of research, practice, and theory.
- 532. Gifted and Talented: Programs.** (2) F, Su
Examination of a variety of programs for gifted and talented students in the schools.
- 535. Gifted and Talented: Curriculum and Instruction.** (2) W, Su
Designing curriculum and instruction for gifted and talented students in the schools.

- 537. Gifted and Talented: Creativity.** (2)
Nature of creativity and approaches to nurturing it.
- 539R. Gifted and Talented: Practicum.** (1-4) F, W
Experience in a school setting under the direction of college faculty.
- 600. Stewardship: The Human Domain.** (3) F, Su
The nature of man and the institutions in which men and women work, with emphasis on leadership performance.
- 601. Stewardship: The Organizational Domain.** (3) W, Su
Selected contemporary theories of organizational behavior and development applied to educational institutions.
- 608. School Community Relations.** (2) F, Su
Understanding and skills necessary to foster positive relationships with the communities and the school.
- 610. Elementary School Leadership.** (2) F, Su
Prerequisite: ELdr. 600 or consent of instructor.
Purpose, organization, and function of the public elementary school. Case studies provide insight and experience with various administrative problems peculiar to elementary schools.
- 612. Secondary School Leadership.** (2) W, Su
Prerequisite: ELdr. 600 or consent of instructor.
Purpose, organization, and administration of secondary schools. Administrative problems: curriculum and instruction, scheduling, beginning and ending school, attendance, discipline, student activities, etc.
- 613. Higher Education in America.** (3) F
Prerequisite: ELdr. 600 or 601.
History and philosophy of the American institution of higher learning, emphasizing its relationship to American civilization.
- 614. Special Education Leadership.** (2) Su
Problems and issues related to the administration of special education programs and units. Legislative and legal guidelines explored.
- 618. Adult and Continuing Education Leadership.** (2) Su
Principles, concepts, procedures, and relationships in administering adult and continuing education in a variety of organizational settings.
- 620. Educational Finance.** (2) Sp, Su
Theory, principles, and general practices of public school finances; equalization and finance problems.
- 622. The Law and Education.** (2) F, Sp, Su
Evolution of American law and its application to American educational systems. Fundamental sources and principles of the law, the judicial structure, and key court cases affecting education in state and federal questions.
- 628. Supervision of Education.** (2) W, Su
Prerequisite: ELdr. 600.
Supervisor's role in improving instruction, curriculum development, and staff professional development.
- 630. Curriculum Inquiry.** (2) F, W, Su
Prerequisite: ELdr. 600.
Examining the curriculum field through an inquiry approach; differentiating curriculum and instruction.

632R. Practicum in Educational Leadership. (1–6) F, W, Sp, Su
Prerequisite: ELdr. 610, 612, 630.

Working with a school administrator as a supervised intern.

634R. Internship in Educational Leadership. (1–12) F, W, Sp, Su
Prerequisite: ELdr. 610, 612, 628.

Field experience in education in state and local school districts, in community colleges, and in other agencies.

636R. Directed Independent Study, Master's. (1–2) F, W, Sp, Su

640. The Community College. (2) W, Su

History and philosophy of the American two-year college, including major trends and prospects for this uniquely American educational institution.

654R. Problems in Educational Leadership. (1–3) F, W
Prerequisite: ELdr. 600.

Problems of extensive and immediate impact on the organization by the operation of legislation, law, social forces, or the public.

658. Political Aspects of Education. (2) F, Su

Understanding processes and institutions in building support for education, and associated issues.

660. Stress Management. (2) W, Sp

Understanding and coping with stress and distress in leadership. Effectively using time in multiple roles in society.

661. Introduction to Research. (3) F, W, Su

Designing and conducting research activities, emphasizing experimental techniques.

665. Evaluation in Education. (2) F, Su

Prerequisite: ELdr. 661.

Nature, purpose, and function of educational evaluation in the school system. Includes designing evaluation projects.

667. Practicum in Evaluation. (2) F, W

Prerequisite: ELdr. 665.

Conducting and reporting a comprehensive project in evaluation.

670R. Workshops in Educational Leadership. (1–3) Sp, Su

Prerequisite: ELdr. 610, 612.

672. Technological Applications in Educational Leadership. (3) F, W, Su

Exploring administrative and instructional applications of technology in public schools. Evaluating software and commercially available materials.

684. Business Administration in Education. (2) W, Alt. term

Administering details of executive business affairs in educational institutions.

686. Professional Negotiations. (2) W, Alt. term

Development of and procedures in negotiations.

688. Educational Facilities. (2) F, Su

School planning, site selection, master planning, writing educational specifications, functions of architects, supervising

and accepting buildings, relationships with governmental agencies, passing bond elections.

691R. Doctoral Seminar. (1–3) Su

Prerequisite: consent of department.

693. Stewardship: Planning and Forecasting. (2) W, Su

Prerequisite: ELdr. 600, 601.

Long-range educational planning in an era of rapid change, emphasizing the identification of problems and the techniques for their resolution.

695R. Independent Research. (1–6) F, W, Sp, Su

Prerequisite: consent of instructor.

Individual research study or project.

696R. Professional Education Project. (1–6) F, W, Sp, Su

Integrating student interest and scholarly opportunity to provide a disciplined experience in observing, gathering, interpreting, and reporting data.

700. Leadership. (3) F, Su

Prerequisite: ELdr. 600 or 601.

Developmental leadership, group processes, concepts, and strategies; opportunity for leadership experience.

701R. Doctoral Orientation Seminar. (1–3) F, Su

Prerequisite: consent of department.

Problems related to the human relations aspect of stewardship principles.

710R. Contemporary Problems in Educational Leadership. (2) W, Su

Critical examination of contemporary educational issues in a variety of categories. Current literature related to issues and problems of American education.

720. The Superintendency. (2) F, Su

Analyzing the comprehensive problems confronting the school superintendent.

731. Principles of Curriculum Development. (3) F, W, Su

Prerequisite: ELdr. 630.

Curriculum planning and design and their implementation in schools.

734R. Directed Independent Study, Doctoral. (1–3) F, W, Sp, Su

Prerequisite: consent of instructor.

737. Principles and Processes of Educational Change. (2) F

Understanding the implications and applying the principles of recent research on the educational change process.

738. Advanced Seminar in Instructional Leadership. (2) F

Principles and theories of instruction applied to leadership activities in education.

739R. Directed Teaching in College. (1–4) F

Teaching at the college level, participating as a member of a college staff, and preparing for employment at a collegiate institution.

759. Policy Development in Education. (2) W, Su

Theory, procedures, and practice in developing policy for educational institutions.

760. College and University Administration. (2) W

Principles and values and their translation into governance policies and practices in higher education.

762. College and University Curriculum. (2) F

Historical review of curriculum evolution in American colleges and universities as it illuminates present challenges facing higher education administrators.

766. Problems in Higher Education. (2) F, W, Sp, Su**768. Theory in Educational Leadership.** (2) W, Su

Theoretical concepts and constructs, theorists, theory development, implications for administrators/supervisors, etc.

775. Data Analysis Techniques in Education. (3) W, Su
Analyzing data in quantitative and qualitative designs.**780. Economic Aspects of Education.** (2) W, Su

Prerequisite: ELdr. 622 or consent of instructor.

Economic basis for financing education; human capital, world view, fiscal and monetary policy.

782. Advanced School Law. (2) W, Su
Prerequisite: ELdr. 622 or consent of instructor.

Impact of the Constitution on education in America. Cases under constitutional law that have influenced policy and practice in the educational system.

783. Higher Education Law. (2) W, Su

Major cases, classic and current, affecting functions and purposes of public and private colleges and universities in America.

788R. Practicum in Educational Leadership. (2-6) F, W, Su
Prerequisite: consent in advance of registration.

Design and implementation of on-site research. Development of a prospectus for the doctorate under the direction of a faculty member.

790R. Seminar in Educational Leadership. (1-4) Su**795. Research and Reporting Techniques for Doctoral Dissertation.** (3) F, W, Su

Research designs for planning and conducting research for the doctoral dissertation using survey, inferential, and experimental methods.

799R. Dissertation. (1-18) F, W, Sp, Su
Prerequisite: ELdr. 795.**Educational Psychology**

Chair: Ronald D. Bingham, 320-A MCKB, 378-4839
Graduate Coordinator: Darwin F. Gale, 320-H MCKB, 378-6175

Faculty/Specialties**Professors**

Bingham, Ronald D. (1971) Ph.D., Pennsylvania State University, 1970. Counseling, Mental Health.
Crandell, John M. (1970) Ph.D., University of Texas, Austin, 1966. Cognitive Processes and Development.
Gale, Darwin F. (1969) Ed.D., Brigham Young University, 1967. Learning Theory, Motivation, Perception.
Harrison, Betty D. (1961) Ph.D., Brigham Young University, 1965. Educational Psychology.
Heaps, Richard A. (1970) Ph.D., University of Utah, 1970. Counseling.

Hilton, Laurence M. (1985) Ph.D., Northwestern University, 1973. Communication Sciences and Disorders.

Ingram, Cregg F. (1975) Ed.D., University of Kentucky, 1974. Special Education and Instructional Systems.

Kelly, Burton C. (1962) Ph.D., University of Chicago, 1966. Counseling.

Rohde, Norma (1965) Ed.D., Brigham Young University, 1965. Counseling.

Thomas, Glen E. (1968) Ed.D., Colorado State College, 1968. Diagnostic Prescriptive Teaching for the Mentally Retarded.

Walton, Wilbur T. (1971) Ph.D., University of Utah, 1969. Learning/Teaching Styles, Educating the Emotionally Handicapped.

Ward, G. Robert (1981) Ph.D., Michigan State University, 1965. Counseling.

Associate Professors

Buckner, Eugene T. (1968) Ph.D., Brigham Young University, 1970. Counseling.

Brinton, Bonnie (1991) Ph.D., University of Utah, 1981.

Child Language Development and Language Disorders.

Chamberlain, Jonathan (1970) Ph.D., University of Wyoming, 1967. Counseling.

Fujiki, Martin (1991) Ph.D., University of Utah, 1980. Normal Language Acquisition and Language Development.

Harris, Richard W. (1982) Ph.D., Purdue University, 1978. Hearing Science, Perception.

Isakson, Richard L. (1983) Ph.D., Cornell University, 1975. Counseling.

Johnson, Richard W. (1968) Ph.D., Brigham Young University, 1968. Counseling.

Kramer, Gary L. (1982) Ph.D., Oregon State University, 1977. Educational Psychology.

Mouritsen, Maren M. (1978) Ed.D., Columbia University, 1979. Educational Psychology.

Winward, Edward J. (1959) Ph.D., University of Missouri, Rolla, 1966. Tests and Measurements.

Wootton, Richard R. (1961) Ed.D., Utah State University, 1969. Counseling and Mental Health.

Young, James R. (1970) Ph.D., George Peabody, 1970. Educational Psychology.

Associate Clinical Professor

Gleave, Robert (1989) Ph.D., Brigham Young University, 19. Individual and Group Counseling.

Assistant Professors

Channell, Ron W. (1983) Ph.D., University of Utah, 1983. Developmental Psycholinguistics.

Richards, P. Scott (1990) Ph.D., University of Minnesota, 1982. Counseling.

Rowe, Fred A. (1972) Ed.D., Arizona State University, 1975. Career Guidance.

Todd, Sally M. (1973) Ph.D., University of Arizona, 1973. Educational Psychology

Graduate Programs and Degrees

Educational Psychology (M.S.)
Educational Psychology (M.Ed.)
Audiology (M.S.)
Speech-Language Pathology (M.S.)
Counseling Psychology (Ph.D.)

Areas of Emphasis

Counseling and guidance, school psychology, special education.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Audiology (M.S.)

Educational Psychology (M.S.)

Special Education

Speech-Language Pathology (M.S.)

Admission and Entry

I. Application requirements:

- A. Deadline: February 15 for fall semester, spring and summer terms.
- B. Entrance examination: General GRE; score subject to review. When taking the GRE, use the institutional number R 4248-1-00. Application will not be considered without GRE scores.
- C. Because of the nature of the clinical professions, both academic and personal qualifications are considered in selecting applicants and in evaluating, retaining, and graduating students.

II. Prerequisite: Appropriate educational and professional experience as determined by major area of study.

III. Entry times: Audiology and speech-language pathology admit fall semester and spring and summer terms. Special education and school psychology admit fall semester and summer term only.

Requirements for Degree

- I. Credit hours (36-48): Depending on area of specialization, minimum of 36-48 hours of approved course work, including elementary-level statistics (3 hours), research (3 hours), and thesis credit (6 hours).
- II. Required courses: Consult departmental specialty area.
- III. Minor: Approved by advisory committee.
- IV. Residence: At least one full semester's registration (9 credit hours minimum) must be completed on the BYU Provo campus.
- V. Thesis.
- VI. Examinations:
 - A. Written comprehensive and/or oral examination.
 - B. Oral defense of thesis.

Educational Psychology (M.Ed.)

Counseling and Guidance

School Psychology

Admission and Entry

I. Application requirements:

- A. Deadline: February 15 for both fall semester and summer term.
- B. Entrance examination: General GRE; score subject to review. When taking the GRE, use the institutional number R 4248-1-00. Application will not be considered without GRE scores.

C. Because of the nature of the counseling and psychology professions, both academic and personal qualifications are considered in selecting applicants and in evaluating, retaining, and graduating students.

II. Prerequisite: Appropriate educational and professional experience as determined by major area of study.

III. Entry times: Counseling and guidance admits fall semester and summer term only. School psychology admits fall semester only.

Requirements for Degree

- I. Credit hours (36-48): Depending on area of specialty, minimum of 36 hours of approved course work including research, practicum, internship, and project.
- II. Required courses: Consult department specialty area.
- III. Residence: At least one full-time registration (9 hours minimum) must be completed on the BYU Provo campus.
- IV. Minor: Approved by advisory committee.
- V. Project.
- VI. Examination: Final written comprehensive examination.

Counseling Psychology (Ph.D.)

Admission and Entry

I. Application requirements:

- A. Deadline: February 15 for fall semester.
- B. Entrance examination: General GRE and subject in education or psychology; score subject to review. When taking the GRE, use the institutional number R 4248-1-00. Application will not be considered without GRE scores.
- C. Because of the nature of the counseling and psychology professions, both academic and personal qualifications are considered in selecting applicants and in evaluating, retaining, and graduating students.

II. Prerequisite:

- A. Master's degree in education or psychology, or in an approved closely related field.
- B. Appropriate professional experience as determined by major area of study.

III. Entry times: Fall semester only.

Requirements for Degree

- I. Credit hours (90-96): Minimum of 72-78 hours of approved course work (which may include, with faculty committee approval, up to 36 hours of appropriate credit from a master's degree), plus 18 hours of dissertation credit.
- II. Required courses: Consult department.
- III. Minor: Approved by advisory committee.
- IV. Residence: Minimum of two consecutive full-time semesters beyond the master's degree (minimum 9 credit hours each semester) on the BYU Provo campus.
- V. Skill requirement: Consult department specialty area.
- VI. Dissertation.

VII. Examinations:

- A. Written comprehensive examination at completion of course work.
- B. Oral defense of dissertation.

Note: EPsy. 581R, 582R, 584R, 585R, and 586R all require a \$40 fee in addition to tuition; EPsy. 680R (school psychology) requires an \$80 fee.

General Educational Psychology Graduate Courses

Note: EPsy. 514R and 515R courses are for certification purposes only and are listed in the BYU General Catalogue. No graduate degree credit is given for 514R; 515R credit may count toward a graduate degree if prior approval is obtained from advisory committee.

501. Test and Measurement Theory. (3) F, W, Su
Independent Study also; no graduate degree credit given for Independent Study.

Basic test and measurement theories. Types of tests. Reliability and validity. Standardization and test construction.

502. Behavior Problems in the School. (3) W, Su
Etiology and correction of behavior problems in children.

601. Advanced Educational Psychology. (3) F, W, Su
General educational psychology: learning theory, motivation, perception, development.

620. Principles of Learning. (3) W
Improving classroom learning through understanding underlying psychological principles and theories.

622. Learning and Motivation. (3) F
Learning and motivation in an educational setting.

623. Learning and Perceptual Processes. (3) Su
Learning and perceptual processes in an educational setting.

672. Empirical Inquiry in Education. (3) F, W, Su
Prerequisite: Stat. 552 or equivalent.

Introduction to empirical research in education. Emphasizes designing, conducting, analyzing, reporting, and evaluating empirical studies in education.

680R. Internship. (1-6) F, W, Sp, Su
Prerequisite: departmental approval.

690R. Seminar. (1-3) F, W, Sp, Su
Check current Class Schedule for seminar topics.

691R. Doctoral Seminar. (1-2) F

692R. Advanced Topics. (1-3) F, W, Sp, Su

693R. Directed Individual Study. (1-3) F, W, Sp, Su
Prerequisite: consent of instructor.

697R. Special Projects. (2-6) F, W, Sp, Su
Prerequisite: Stat. 552 and EPsy. 672 or equivalent.

699R. Master's Thesis. (1-6) F, W, Sp, Su

780R. Advanced Internship. (2-8) F, W, Sp, Su
Prerequisite: departmental approval of application and placement one semester in advance of registration.

790R. Advanced Seminar. (1-3) W, Su
Check current Class Schedule for seminar topics.

799R. Doctoral Dissertation. (1-9) F, W, Sp, Su
Prerequisite: completion of skill requirements.

Formal report and defense of a substantive research topic designed to make an original contribution to knowledge in the field.

Counseling Graduate Courses

546. Helping Relationships: Basic Concepts and Skills. (1-3) F, W

Basic interviewing and helping skills. For students interested in professional, paraprofessional, peer, or lay counseling.

600. Introduction to Counseling and Guidance Services. (3)
Independent Study also; no graduate degree credit given for Independent Study.

Introduction to the counseling profession: history, philosophy, issues, trends, and current status. Role of counselor in school and community agency settings.

606. Psychological Foundations of Counseling. (3) Su
Fundamental concepts and theories of motivation, human development, learning, personality, and abnormal psychology as they relate to counseling.

645. Testing in Counseling and Guidance. (3) F
Prerequisite: EPsy. 501, 600.

Administering and interpreting specific group-standardized tests: personality, relationships, achievement, ability, behavioral, etc.

646. Counseling Theory and Interventions. (3) F
Prerequisite: EPsy. 600.

Various theories of counseling, current research, and accepted practices.

647. Individual Testing in Education. (3) F, W
Prerequisite: EPsy. 501, 625 and/or 645, and consent of instructor.

Theory and experience in administering and interpreting individual intelligence tests in an educational setting.

648. Group Counseling and Interventions. (3) W
Prerequisite: EPsy. 646 or consent of instructor.

Various approaches to group counseling. Developing and participating in structured group experiences.

649. Life Span and Career Development. (3) F
Prerequisite: EPsy. 600.

Theories of vocational development. Influences of the world of work on career development; understanding career selection processes.

650. Leadership in Counseling and Guidance. (3) Sp
Prerequisite: EPsy. 600.

Leadership theory; organizing, administering, and implementing counseling and pupil personnel services in schools and other settings.

654. Educational and Career Guidance. (3) W

Requirements for a resource center; knowledge of resources available in the community; an applied approach to career guidance.

655. Personal and Social Guidance. (3) W

Substance abuse, teenage pregnancy, suicide, multicultural issues, interpersonal relations, and other related issues.

665. Career Assessment. (3) W

Applying testing and measurement theory in the areas of aptitudes, interests, and values in the counseling process.

678. Counseling Skills Practicum. (3) F

Observing counseling techniques in settings where counseling takes place. Practicing beginning counseling skills. Laboratory required.

679. Counseling and Guidance Practicum. (3) W, Sp

Prerequisite: EPsy. 678; departmental approval of application and placement one semester in advance of registration.

Supervised beginning and intermediate counseling techniques and other responsibilities in school or community counseling settings. Laboratory required.

680R. Counseling and Guidance Internship. (2-6) F, W, Sp, Su

Prerequisite: EPsy. 679; departmental approval of application and placement one semester in advance of registration.

Practicing individual and group skills, testing and other techniques, and responsibilities consistent with advanced master's students.

695R. Counseling Seminar. (1-3) F

710. Ethics and Standards in Counseling Psychology. (3) F

Ethics and standards applied to counseling and psychology, including legal issues, licensing, and professionalism.

715. Diagnosis of Psychological Problems in Counseling. (3) Sp

Theory, diagnosis, and classification of emotional problems related to education, psychology, and counseling.

720. Fundamentals of Learning Theory and Cognitive Development. (3) Sp

Learning and cognitive developmental theories and their application to behavioral change.

725. Theory and Practice of Objective Personality Tests: MMPI. (3) W

Administering and interpreting the MMPI with relevant application and current research. Enrollment limited to doctoral students in counseling.

745. Advanced Counseling Theory. (3) F

Prerequisite: EPsy. 646.

Various theoretical approaches to counseling.

746R. Supervision Theory and Practice in Counseling. (3) W

Prerequisite: EPsy. 680R and consent of instructor.

This course is taken in two parts: (1) student must first enroll summer term for the Theory of Supervision part; then (2) enroll during a subsequent fall or winter semester for the Practice of Supervision part.

748. Advanced Group Theory and Process. (3) W

Prerequisite: EPsy. 648.

Advanced theory of groups.

779R. Advanced Practicum in Counseling. (1-4) W

Prerequisite: EPsy. 680R; departmental approval and placement one semester in advance of registration.

780R. Doctoral Clerkship in Counseling. (2-8) F, W, Sp, Su

Prerequisite: EPsy. 779 and departmental approval. Students must submit application for practicum one semester in advance of registration.

790R. Advanced Seminar. (1-4) F

Prerequisite: departmental approval.

Special Education Graduate Courses

503. Education of Students with Mild and Moderate Handicaps. (3) F, W, Su

Prerequisite: EPsy. 405, 480R, and concurrent registration in EPsy. 586R.

505. Psycho-educational Implications of Exceptionality. (1-3) F

506R. Behavioral Science Foundations for Special Education. (1-3) F, Su

510. Education of Emotionally and Behaviorally Handicapped Children. (3) F, W, Su

Prerequisite: EPsy. 204, 305, consent of instructor, and prior application.

511. Curriculum for Students with Emotional and Behavioral Handicaps. (3) W

Prerequisite: EPsy. 510 and consent of instructor.

518. Education of the Gifted and Talented. (2) W, Su

Various approaches to educating the gifted and talented.

519. Educating Students with Severe and Profound Handicaps. (1-3) F, W, Su

Prerequisite: consent of instructor, EPsy. 101R, 204, 305, 403. Independent Study also; no graduate degree credit given for Independent Study.

520. Curriculum for Students with Intellectual Handicaps. (1-3) W, Su

Prerequisite: EPsy. 519.

521. Curriculum Planning for Students with Severe and Profound Handicaps. (1-3) W, Sp

Prerequisite: EPsy. 305, 380R, 403, 519.

525. Education of Students with Learning Disabilities. (3) F, Sp

Prerequisite: consent of instructor.

526. Curriculum for Students with Learning Disabilities. (3) W, Sp

Prerequisite: EPsy. 525.

Organization of educational programs, curriculum development, and teaching methods for children with learning disabilities.

580R. Directed Observation in the Schools. (1-3) F, W, Sp, Su

Prerequisite: consent of instructor.

581R. Practicum in Educating the Intellectually Handicapped. (1-8) F, W, Su

Prerequisite: EPsy. 520; departmental approval of application, and placement one semester in advance of registration. Fee.

582R. Practicum in Educating the Emotionally and Behaviorally Handicapped. (1-8) F, W, Su

Prerequisite: consent of instructor, EPsy. 511, and prior application. Fee.

584R. Practicum in Learning Disabilities. (2-8) F, W, Sp

Prerequisite: EPsy. 526; departmental approval of application, and placement one semester in advance of registration. Fee.

586R. Practicum in Educating the Mildly and Moderately Handicapped. (1-8) F, W, Su

Prerequisite: concurrent registration in EPsy. 503; departmental approval of application, and placement one semester in advance of registration. Fee.

588R. Practicum in Educating the Severely and Profoundly Handicapped. (1-8) W, Sp

Prerequisite: concurrent registration in EPsy. 521; departmental approval of application one semester in advance of registration. Fee.

603. Guidance and Counseling of the Exceptional Child. (3) W, Su**604. Special Education Services in Public Schools.** (2) Sp, Su**625R. Psychological-Educational Assessment of Learning.** (3) F, W, Sp, Su

Prerequisite: consent of instructor.

626. Advanced Curriculum in Special Education. (3) W, Su

Prerequisite: EPsy. 205 or equivalent.

680R. Internship. (2-6) F, W, Sp, Su

Prerequisite: departmental approval of application and placement one semester in advance of registration.

Practicing individual and group skills, testing, and other techniques and responsibilities consistent with advanced master's students.

690R. Seminar in Special Education. (1-3) F, W, Sp, Su**School Psychology Graduate Courses****502. Behavior Problems in the School.** (3) W, Su**610. Problems and Issues in School Psychology.** (3) F**680R. Internship.** (2-6) F, W, Sp

Prerequisite: departmental approval of application and placement one semester in advance of registration. Must be taken concurrently with 690R seminar.

Practicing individual and group skills, testing, and other techniques and responsibilities consistent with advanced master's students.

690R. Seminar in School Psychology. (1-3) F, W

Discussion of problems and issues in school psychology. Must be taken concurrently with 680R internship.

Audiology Graduate Courses**500. Clinical Data Acquisition and Analysis.** (3)

Research methods in audiology and speech language pathology; applying statistical techniques; professional literature and writing.

544. Advanced Hearing Science. (3) Sp, Su alt. term

Hearing anatomy, physiology, and science.

576. Computers in Speech-Language Pathology and Audiology. (1)

Characteristics of software and specialized hardware applied to computational study and interventions with language, speech, and hearing.

616. Acoustic Impedance Measures. (2) F

Middle ear measurements and special test applications.

617. Auditory Physiological Tests 1. (3) F

Introduction: electronystagmography, evoked potential testing.

618. Auditory Physiological Tests 2. (2) W

Advanced procedures: electronystagmography, evoked potentials.

638. Advanced Hearing Tests and Measures. (3) F

Advanced audiometric procedures assessing impaired hearing.

639. Community and Industrial Audiology. (2) Sp, Su alt. term

Hearing problems in industry; legal implications.

641. Hearing Aids. (3) F

Assessing hearing aid performance and the art of fitting hearing aids.

643. Adult Aural Rehabilitation. (2) W

Rehabilitative audiology for hearing-impaired adults.

671. Instrumentation-Calibration. (2) Sp, Su alt. term

Calibration of audiological instruments.

673. Pathologies of the Auditory Mechanism. (3) W

Prerequisite: EPsy. 334, 438.

Hearing disorders of outer, middle, inner ear, and central auditory pathway.

680R. Internship. (2-6) F, W, Sp, Su

Prerequisite: consent of instructor four weeks in advance of registration.

Practicing individual and group skills, testing, and other techniques and responsibilities consistent with advanced master's students.

685R. Practicum in Speech-Language Pathology and Clinical Audiology. (1-8) F, W, Sp, Su

Prerequisite: consent of instructor.

690R. Seminar in Audiology. (1-3) Sp, Su alt. term**694R. Special Projects in Speech-Language Pathology or Clinical Audiology.** (1-3) F, W, Sp, Su

Prerequisite: consent of instructor.

699R. Master's Thesis. (1-6) F, W, Sp, Su

Speech-Language Pathology Graduate Courses

A full undergraduate program in speech-language pathology must be completed before taking any of the following graduate courses, or additional prerequisite courses must be taken.

500. Clinical Data Acquisition and Analysis. (3)

Research methods in audiology and speech language pathology; applying statistical techniques; professional literature and writing.

573. Aphasia. (3) W

574. Language and Other Communicative Disorders of the Severely Handicapped. (3) F

575. Motor Speech Disorders. (3) F

Neurophysiology, symptomatology, clinical assessment, and treatment of adult motor speech disorders.

576. Computers in Speech-Language Pathology and Audiology. (1)

Characteristics of software and specialized hardware applied to computational study and interventions with language, speech, and hearing.

630. Theories of Language Intervention. (3) W

Prerequisite: EPsy. 575.

633. Dysphagia and Head Trauma Management. (2) Alt. term

Acquired swallowing and eating disorders, rehabilitation of dysphagia, and traumatic brain injury and cognitive rehabilitation therapy.

662. Maxillofacial and Related Disorders of Human Communication. (2) Alt. term

680R. Internship. (3) F, W, Sp, Su

685R. Practicum in Speech-Language Pathology and Clinical Audiology. (1-8) F, W, Sp, Su

Prerequisite: consent of instructor.

690R. Seminar in Language Disorders. (3) Alt. term

690R. Seminar in Speech Pathology. (3) Alt. term

694R. Special Projects in Speech-Language Pathology or Clinical Audiology. (1-3) F, W, Alt. term

699R. Thesis. (1-6) F, W, Sp, Su

Elementary Education

Chair: Paul M. Hollingsworth, 215 MCKB, 378-4077

Graduate Coordinator: D. Ray Reutzel, 217-C MCKB, 378-4847

Faculty/Specialties

Professors

Allred, Ruel A., Associate Dean (1961) Ed.D., University of Oregon, 1965. Reading, Language Arts Education.

Clark, H. Clifford (1969) Ed.D., Brigham Young University, 1963. Mathematics Education.

Eldredge, J. Lloyd (1981) Ed.D., University of Utah, 1970. Reading Education.

Hollingsworth, Paul M. (1985) Ed.D., Arizona State University, 1964. Reading and Language Arts Education.

Tolman, Marvin N. (1975) Ed.D., Utah State University, 1975. Science Education.

Associate Professors

Cook, Paul F. (1977) Ph.D., Brigham Young University, 1968. Elementary Curriculum, Supervision, Research Design.

Cooter, Robert B. (1989) Ed.D., University of Tennessee, 1983. Reading, Language Arts Education.

Jacobs, James S. (1976) Ed.D., University of Georgia, 1978. Children's Literature.

Nelson, Marvin N. (1959) Ph.D., University of Utah, 1975. Mathematics Education.

Reutzel, D. Ray (1985) Ph.D., University of Wyoming, 1982. Language Arts, Reading Education and Research Design.

Assistant Professor

Chilcoat, George (Skip) (1989) Ed.D., Arizona State University, 1983. Social Studies Education.

Graduate Programs and Degrees

Teaching and Learning (M.A., M.Ed.)
Reading (Ed.D.)

Ph.D. Emphasis in Literacy Education

Students interested in a Ph.D. degree with an emphasis in literacy education should consult the Instructional Science Department.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Teaching and Learning (M.A., M.Ed.)

The M.Ed. programs in teaching and learning provide two options for completing graduation requirements. The student may elect the summer residency program or the full-time, on-campus program. The summer residency option leads to an M.Ed. degree and consists of a minimum of three full-time summers on the campus, with intervening supervised field experiences during the fall and winter semesters. The on-campus program leads to either the M.Ed. or the M.A. degree and is for those who attend the university as full-time students. Both programs are designed for fall, winter, and summer entrance.

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examination: Acceptable scores on verbal, quantitative, and analytical sections of Graduate Record Examination (GRE). Scores (not to be more than five years old) must be submitted to Department of Elementary Education when applying.

C. GPA: Minimum of 3.0 for last 60 hours.

D. Teaching record: One year or equivalent of successful teaching experience.

II. Entry time: Fall or winter semester or summer term.

Requirements for Degree

- I. Credit hours (36): Minimum 36 course work hours.
- II. Required courses: Determined in consultation with advisory committee. A maximum of 10 semester hours of approved graduate transfer credit is allowed.
- III. Faculty recommendation upon completion of EEd. 672R.
- IV. Residency:
 - A. Full-time, on-campus program: Two consecutive full-time semesters.
 - B. Summer residency: Minimum three consecutive full-time summer terms with supervised course work during fall and winter semesters for two years.
- V. Thesis (M.A.: 6 hours, EEd. 699R) or professional improvement project (M.Ed.: 3 hours, EEd. 693R, 695R, 696R).
- VI. Examinations:
 - A. Comprehensive written or oral examination.
 - B. Oral defense of thesis or project.

Reading (Ed.D.)

Admission and Entry

- I. Admission application evaluated by department graduate faculty. Admission considered according to resources available.
- II. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: Acceptable combined scores on verbal, quantitative, and analytical sections of Graduate Record Examination (GRE). Scores (not to be more than five years old) must be submitted to Department of Elementary Education when applying.
 - C. GPA: Minimum 3.0 for last 60 hours.
 - D. Successful completion of three years of acceptable professional teaching experience in education or equivalent experience.

Requirements for Degree

- I. Credit hours (95): Minimum 95 hours, including 12 dissertation hours (EEd. 799R). Up to 36 hours from an approved master's degree may apply.
- II. Skill requirements (included in 95 required hours). Courses required:
 - ELdr. 517: Professional and Scholarly Writing in Education
 - EPsy. 651: Quantitative Reasoning
 - EPsy. 653: Measurement Theory
 - EPsy. 672: Empirical Inquiry in Education or EEd. 672R: Introduction to Research Design
- III. Required courses:
 - A. 36 hours required in reading, including 12 hours of dissertation. A minimum of 12 hours must be taken outside the College of Education or concentrated within another department of the college.

- B. Remaining hours to be determined in consultation with advisory committee.
- IV. Residency: Two consecutive full-time semester registrations (9 hours each).
- V. Dissertation.
- VI. Examinations:
 - A. Written and oral comprehensive examinations taken upon completion of course requirements.
 - B. Oral defense of dissertation.
- VII. Time limit: Graduate within eight years following admission.

Elementary Education Graduate Courses

Note: EEd. 514R and 515R are for certification purposes only and are listed in the BYU General Catalogue.

530. **Principles of Learning.** (3) Su
Improving classroom learning through understanding underlying psychological principles and theories.
533. **Written Expression in the Elementary Schools.** (2) On dem.
Foundation, objectives, and strategies for teaching the writing process to elementary students, including spelling, handwriting, and integration with listening and speaking skills.
620. **Organization and Administration of Reading Programs.** (2) On dem.
Examining ways to organize and administer school and classroom reading programs. Examining issues relating to program types, reading assessment, grouping, grade level articulation, and supervision.
632. **Science in Elementary Education.** (2) F, Su
Teaching elementary science; current developments and trends. Planning instructional materials and procedures for a science curriculum.
633. **Trends and Issues in Literacy Education.** (3) On dem.
Research, literature, and trends in listening, speaking, and writing, with their implications for instruction.
635. **Mathematics in Elementary Education.** (2) Su
Issues, research, and innovations in teaching elementary school mathematics.
636. **Social Studies in Elementary Education.** (2) Su
Domains, methods, and theories of social studies, including innovative content, e.g., law-related education, consumer education, etc.
640. **Literature for Young People.** (2) W, Su
Overview of (primarily) American literature of elementary school pupils; contemporary authors, trends, and classroom applications.
641. **Trends and Issues in Reading.** (3) F, Su
Developmental, functional, and recreational reading, with focus on research, literature, and trends in reading instruction.
642. **Emergent Literacy.** (2) F, Su alt. yr.
Needs of young readers and approaches to teaching them to read.

645. Classroom Reading Diagnosis. (3) F

Formal and informal diagnostic procedures for classroom teachers to use in assessing and correcting reading deficiencies.

647. Comprehending Expository and Narrative Text. (2) W, Su alt. yr.

Comprehending and retaining text materials in different subject areas, including study and writing strategies for learning from school texts.

648R. Practicum in Reading. (4V) W

Prerequisite: EEd. 645.

Diagnosing reading difficulties, designing effective teaching strategies, and evaluating effectiveness of instruction.

650. Technology in Reading and Evaluation of Reading Materials. (3V) On dem.

Using available software and technology for reading instruction in elementary schools and a critical analysis of print and nonprint materials.

660. Historical Foundations in Reading. (2) W

An in-depth study of the history of reading education, books, and reading instruction with implications for present-day reading practices.

672R. Introduction to Research Design. (3V) F, Su

Introduction to designing, conducting, analyzing, reporting, and evaluating research studies in education.

676. Research in Reading. (2) Su

Prerequisite: EEd. 641.

Research literature in reading, both classical and current, emphasizing application of findings to educational practice.

680R. Professional Internship. (6V) F, W, Sp, Su

Professional work experience in area of specialization under direction of a faculty member.

690. Master's Colloquium. (1) On dem.

Current research and educational studies by faculty and students for collegial critique and analysis.

693R. Directed Individual Study. (4V) F, W, Sp, Su

695R. Independent Research. (6V) F, W, Sp, Su

Conceptualizing, designing, implementing, and evaluating a student-initiated project in a school classroom for curriculum improvement.

696R. Professional Education Project. (6V) F, W, Sp, Su

Developing, observing, gathering, interpreting, and reporting data derived from a project in relation to the student's professional assignment.

699R. Master's Thesis. (6V) F, W, Sp, Su

Formal report and defense of substantive research, evaluation, or curriculum project designed to make an original contribution to knowledge in the field.

734. Literacy Seminar. (2) On dem.

Significant research and publications in language arts and their implications for classroom practice.

740. Theoretical Models of Reading. (2) Su alt. yr.

In-depth study of the theoretical models of the reading process. Statistical, psychological, literary, linguistic, and motivational models analyzed and critiqued.

741. Psychology and Physiology of Reading. (2) Su alt. yr.

Physiology of the eye, ear, and brain as these relate to the reading act and potential reading disabilities; psychophysical measurement methods.

742. Teaching Reading Vocabulary and Comprehension. (2) On dem.

Theories and research studies of vocabulary acquisition and reading comprehension as they relate to effective teaching.

743. Oral Language Acquisition: Parallels in Reading and Writing Development. (2) On dem.

Developmental reading stage theories, writing development theories, and invented spelling research; how these relate to oral language acquisition.

780R. Professional Internship. (8V) F, W, Sp, Su

Professional work experience in area of specialization under direction of a faculty member.

790R. Advanced Seminar. (3V) On dem.

Significant research and publications and their implications to reading instruction.

793R. Directed Individual Study. (4V) F, W, Sp, Su

795R. Independent Research. (6V) F, W, Sp, Su

Conceptualizing, designing, implementing, and evaluating student-initiated research.

799R. Dissertation. (12V) F, W, Sp, Su

Formal report and defense of substantive research, evaluation, or curriculum project designed to make an original contribution to knowledge in the field.

Instructional Science

Chair: Paul F. Merrill, 201 MCKB, 378-7072

Faculty/Specialties

Professors

Fawson, E. Curtis (1986) Ed.D., Utah State University, 1984. Curriculum Development and Supervision with Emphasis in Instructional Technology.

Harrison, Grant V. (1969) Ed.D., University of California, Los Angeles, 1969. Product Research.

Merrill, Paul F. (1977) Ph.D., University of Texas, Austin, 1970. Instructional Strategies and Computer Applications to Education.

Osguthorpe, Russell T., Associate Dean (1978) Ph.D., Brigham Young University, 1975. Research with Handicapped Students.

Van Mondfrans, Adrian P. (1971) Ph.D., University of Wisconsin, Madison, 1967. Evaluation Theory and Practice.

Associate Professors

Green, Edward E. (1972) Ed.D., Indiana University, Bloomington, 1972. Instructional Design.

Inouye, Dillon K. (1978) Ph.D., Stanford University, 1978. Productivity in Learning.

Williams, David D. (1980) Ph.D., University of Colorado, Boulder, 1981. Naturalistic Evaluation, Research, Teacher Education.

Assistant Professor

Sudweeks, Richard R. (1980) Ph.D., University of Illinois, 1978. Educational Measurement and Evaluation.

Graduate Programs and Degrees

Instructional Science (M.S.)

Instructional Psychology (Ph.D.)

Instructional Science (Ph.D.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Department Mission

The mission of the Department of Instructional Science is to enhance learning by improving instruction and teaching. In partnership with others, the department will (1) search for knowledge that improves instruction; (2) apply knowledge and technology to solve instructional problems; (3) empower students with knowledge and skills in instructional development, research, and evaluation.

Students in each degree program are required to take basic courses in the following areas of disciplined inquiry in instruction: design and development, research, measurement, and evaluation. They are also required to acquire collateral tools from other disciplines such as statistics, computer science, human resource management, and communications. Specialized courses are offered to deepen the candidate's knowledge and theoretical sophistication. Professional skills are developed through extensive project and internship experiences offered in the schools, church, home, and community.

Graduate Minors in Instructional Science

Master's and doctoral students in other departments wishing to take a minor in instructional science should counsel with the instructional science faculty member appointed to their advisory committee in selecting the appropriate courses (9 hours of course work required for a master's minor, 12 hours for a doctoral minor).

Program and Degree Requirements

Instructional Science (M.S.)

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examination: General GRE; score subject to review. When taking the GRE, use the institutional number R 4248-1-00. Application will not be considered without GRE scores.

C. Letter of intent.

D. Three letters of recommendation.

II. Prerequisite: (6 hours) ELdr. 517 or Engl. 316; Comms. 272, IndE. 250 or IS 587.

III. Entry times: Fall semester and summer term recommended.

Requirements for Degree

I. Credit hours (32): Minimum 26 course work hours plus 6 thesis hours (IS 699R).

II. Required courses: (14 hours) IS 515R (Microcomputers in Schools), 551, 564, 651, 652.

III. Specialization: 9 hours to be determined in consultation with advisory committee.

IV. Internship: 3 hours (IS 680R).

V. Thesis: 6 hours (IS 699R).

VI. Examinations: Oral defense of thesis.

Instructional Psychology (Ph.D.)

Instructional Science (Ph.D.)

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examination: General GRE; score subject to review. When taking the GRE, use the institutional number R 4248-1-00. Application will not be considered without GRE scores.

C. Letter of intent.

D. Three letters of recommendation.

II. Prerequisite: (3 hours) ELdr. 517 or Engl. 316.

III. Skill requirement: IS 515R (Microcomputers in Schools); IS 560; IS 551 and 651, or Stat. 552 and 554, or Stat. 501, or Psych. 501; Stat. 502 or Psych. 502; and additional computer science or statistics courses as approved by the advisory committee for a total of 18 hours.

IV. Entry times: Fall semester or summer term recommended.

Requirements for Degree

I. Credit hours (73): Minimum of 55 course work hours plus 18 dissertation hours (IS 799R).

II. Required courses: (16 hours) IS 620 or Psych. 560, IS 564, 652, 661, 672 or Psych. 600.

III. Specialization: 18 hours as determined in consultation with advisory committee.

IV. Internship: 12 hours (IS 680R).

V. Three projects: 9 hours.

VI. Residence: At least two consecutive 6-hour semesters on the BYU Provo campus.

VII. Examinations:

A. Comprehensive written examination.

B. Oral defense of dissertation.

VIII. Time limit: All requirements for the doctorate must be completed within an eight-year period.

Instructional Science Graduate Courses

515R. Microcomputers in Schools. (1-3)

Application of computer technology in the public schools; evaluation of educational software programs; use of computer tools; computer programming in LogoWriter.

551. Introduction to Quantitative Reasoning. (3)

Introduction to statistical reasoning and methodology. Emphasizes the meaning and use of quantitative methods in answering substantive questions of educational research and practice. Use of computer software packages.

560. Microcomputer Materials Production. (3)

Prerequisite: IS 286 or 515R (Microcomputers in Schools).

Designing, programming, and debugging educational applications of microcomputers using a high-level computer language.

564. Instructional Design. (3)

Identifying instructional problems; specifying objectives, instructional strategies, and media; analyzing learning outcomes; developing instructional materials and assessment instruments; validating instructional systems.

587. Audiovisual Production. (3)

Designing, producing, and using audio and visual instructional materials. Applying 35-mm photography and audio recording and mixing to education.

620. Principles of Learning. (3) F

Improving classroom learning through understanding underlying psychological principles and theories.

651. Quantitative Reasoning. (3)

Prerequisite: IS 551 or equivalent.

Use of analysis of variance and multiple regression/correlation in analyzing and interpreting results of educational research and evaluation.

652. Assessing Learning Outcomes. (4) W, Su

Prerequisite: IS 551 or Stat. 552 or equivalent.

Selecting and constructing instruments and procedures for assessing affective, behavioral, and cognitive outcomes of education.

653. Measurement Theory. (3) F

Prerequisite: IS 651, 652, or equivalent.

Classical and modern models for measuring human attributes. Issues related to reliability, validity, item selection, scoring, standard setting, and test equating. Use of item response theory and generalizability theory.

657R. Measurement Project. (1–3) F, W, Sp, Su

Prerequisite: IS 651, 652.

Designing, conducting, and reporting a comprehensive measurement project.

660. Authoring of Interactive Video. (3) W

Prerequisite: IS 560, 564.

Designing, developing, producing, and authoring intelligent, interactive video courseware. Budgets, project steps, equipment systems, and authoring.

661. Evaluation in Education. (3) F, Su

Nature, purposes, and functions of educational evaluation in making judgments about teachers, instructional materials, academic programs, curricula, and school systems.

663. Evaluation of Educational Programs and Curricula. (3) W

Prerequisite: IS 661 or consent of instructor.

Problems in designing, conducting, and reporting the results of program and curriculum evaluations.

664. Advanced Instructional Design. (3) W, Su

Prerequisite: IS 564.

Advanced laboratory in instructional system design, production, formative evaluation, packaging, and implementation. Systematic critical analysis of all phases of development.

667R. Evaluation Project. (1–3) F, W, Sp, Su

Prerequisite: IS 661.

Designing, conducting, and reporting a comprehensive project in evaluation.

672. Empirical Inquiry in Education. (3) W, Su

Prerequisite: IS 651 or equivalent.

Introduction to empirical research in education. Emphasizes designing, conducting, analyzing, reporting, and evaluating empirical studies in education.

673. Research Synthesis and Conceptualization. (3) F

Prerequisite: IS 672.

Survey of major research problems, questions, and theories that have been investigated in instructional science. Preparing critical, integrative synthesis of completed research; conceptualizing problems for further inquiry. Research prospectus required.

674R. Inquiry Methods. (1–3) W, Su

Prerequisite: IS 672 or consent of instructor.

Specific inquiry strategies for researching practical educational problems. Strategy studied varies from section to section.

Naturalistic Inquiry in Education

Quasi-experimental Studies

Cost-Benefit Analysis in Education

Meta-Analysis

Theory Building and Modeling in Education

677R. Research Project. (1–3) F, W, Sp, Su

Prerequisite: IS 672.

Designing, conducting, and reporting a comprehensive project in research.

680R. Internship. (1–6) F, W, Sp, Su

Prerequisite: departmental approval

682. Project and Instructional Resource Management. (3)

Su

Managing research, development, and evaluation projects in public schools and higher education. Planning, budgeting, supervising, managing personnel, and scheduling.

687R. Development Project. (1–3) F, W, Sp, Su

Prerequisite: IS 564.

Designing, conducting, and reporting a comprehensive project in development.

690R. Seminar. (1–3)

Check current Class Schedule for seminar topics.

692R. Advanced Topics. (1–3)

693R. Directed Individual Study. (1–3) F, W, Sp, Su

Prerequisite: consent of instructor.

699R. Master's Thesis. (1–6) F, W, Sp, Su

760. Advanced Computer-based Instruction. (3) F

Prerequisite: IS 560.

Current issues, research, and applications of computer technology in education. Advanced programming.

790R. Advanced Seminar. (1–3) F, W, Sp, Su

Check current Class Schedule for seminar topics.

799R. Doctoral Dissertation. (1–9) F, W, Sp, Su

Prerequisite: completion of skill and project requirements.

Formal report and defense of a substantive research topic designed to make an original contribution to knowledge in the field.

Secondary Education

Chair: C. Garn Coombs, 110 MCKB, 378-4250
 Graduate Coordinator: Joseph Hugh Baird, 149-F MCKB, 378-3177

The Department of Secondary Education does not offer a graduate degree but offers the following graduate courses. Refer to the BYU General Catalogue for faculty listings.

Secondary Education Graduate Courses

Note: ScEd. 514R is for in-service education purposes only. Topics are listed in the BYU General Catalogue.

515R. Special Topics in Education. (1-3) On dem.

Learning and Teaching
 Science Education
 Middle Education

531. Effective Classroom Instruction. (2) F, Su

Developing strategies to initiate and to maintain effective learning in elementary and secondary classrooms. Expanding teaching perspectives and acquiring observational skills.

539R. Practicum in Learning and Teaching. (1-8) F, W, Sp, Su

Experience in a school setting under direction of college faculty.

601. Structure, Function, and Outcomes of Education. (3) F, Su

Relationships between purposes of education and means selected to achieve those aims. Establishing and maintaining integrity in educational practice.

606. Western Educational Thought and Practice. (3) W, Su

History of educational thought and practice, including pedagogical reform, national systems, and recent trends.

607. Multicultural Education. (3) F, Sp

Exploring common cultural universals from archaic and modern societies to develop skills for learning within a culturally diverse environment.

649. College and Adult Basic Reading. (2) Sp

Prerequisite: one course in reading or consent of instructor.

Adult basic education programs; advanced work in community college and university reading services.

660. Historical Foundations in Reading. (2) W

An in-depth study of the history of reading education, books, and reading instruction with implications for present-day reading practices.

693R. Directed Individual Study. (1-4) F, W, Sp, Su

698R. Master's Project. (1-6) F, W, Sp, Su

699R. Master's Thesis. (1-6) F, W, Sp, Su

Engineering

The College of Engineering and Technology offers the graduate degree programs listed below. More detailed descriptions of program requirements for the master of science degree, the integrated master's program, and the

Ph.D. program are included in the engineering department summaries that follow this section.

Graduate Programs

Master of Science

Each department offers one or more master of science programs. Some are thesis programs, others project programs, and others course work only programs. The total number of hours required varies from 34 to 40 depending on the program. As a minimum, candidates for a master of science degree must have earned a B.S. degree in an appropriate field or be enrolled in an integrated master's program.

Integrated Master's Program

Students who desire to obtain a master's degree in engineering, and who have been accepted to a department professional program, may elect to enter the integrated master's program at the end of the sophomore year or during the junior year of the engineering curriculum. The purpose of the program is to afford greater flexibility in scheduling course work than is normally available through a traditional B.S. degree followed by an M.S. degree program. In this program the B.S. degree may be received before or simultaneously with the M.S. degree (normally five years from freshman matriculation). Consult with the specific department of interest for procedures, application forms, and other details.

Ph.D. Program in Engineering

Requirements for this degree are described in the engineering department summaries that follow.

Residence Requirements

The major part of the work toward the master of science thesis and the doctor of philosophy dissertation must be completed under the specific direction of a graduate faculty member while the student is in residence at BYU (at least two consecutive full-time semesters). In residence is defined as: (1) being registered for credit as a graduate student and (2) living and conducting research in the general vicinity of the university, where the faculty member has ready access to research facilities and consultation between the student and faculty member is unencumbered. Further, all work applying toward any master's project, thesis, or doctoral dissertation must be completely open for university review and publication. Any exceptions to the above must be supported by written approval from the department and college and obtained in advance of any work being performed. See the general requirements section of the catalogue for more details concerning the university's residency requirements.

Master of Engineering Management

Master of Technology Management

Program Director: Merrill Bushnell, 270 CB, 378-4326

The master of engineering management (M.E.M.) program and the master of technology management (M.T.M.) program are designed to assist graduates from the engineering and technology departments to obtain an education that will enhance their ability to move into technical management. The programs include a significant commitment

to advanced engineering or technology training and management skills that will be useful in entry-level technical management.

Minimum requirements include a B.S. degree in engineering or technology or enrollment in an integrated master's program (with the expectation of completing a B.S. degree by December of the year of entry and the ability to include required management courses taught during the term or semester of entry). Entrance is competitive and the program is limited to 40 students. Scholarship funds are available from the Jerry Christiansen scholarship funds.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: General GRE for applicants from non-ABET (Accreditation Board for Engineering and Technology, Inc.) accredited institutions.
 - C. Indicate in statement a desire to be considered for program.
 - D. Submit application to Graduate Admissions, B-356 ASB. When application is complete it will be sent to the M.E.M./M.T.M. program director, 270 CB.
- II. Prerequisite: Baccalaureate degree in engineering or technology.
- III. Entry times: Spring and summer terms and fall semester.

Requirements for Degree

- I. Credit hours (40): Minimum 40 course work hours.
- II. Basic curriculum requirements:
 - A. Spring term: MBA 680 (3), technical course (3)
 - B. Summer term: Mgt. 551 (3), MBA 565 (2), technical courses (3)
 - C. Fall semester: Mgt. 501 (3), 561 (3), EngT 500 (1), technical courses (6)
 - D. Winter semester: Mgt. 511 (3), 541 (3), 562 (3), EngT 501 (1), technical courses (3)
- III. Residence: See below.

Courses for Master of Engineering Management and Master of Technology Management

- 501. Managerial Accounting. (3)
- 511. Managerial Finance. (3)
- 541. Marketing Management. (3)
- 551. Organizational Behavior. (3)
- 561. Operations Management. (3)
- 562. Project Management. (3)
- 565. Written and Oral Communication. (2)
- 580. Business Policy. (3)

Chemical Engineering

Chair: Richard L. Rowley, 350 CB, 378-2586

Graduate Coordinator: Kenneth A. Solen, 350-G CB, 378-6237

Faculty/Specialties

Professors

- Bartholomew, Calvin H. (1973) Ph.D., Stanford University, 1972. Catalysis.
- Beckstead, Merrill W. (1977) Ph.D., University of Utah, 1965. Combustion of Solid Propellants.
- Bennion, Douglas N. (1980) Ph.D., University of California, Berkeley, 1964. Electrochemical Engineering.
- Hanks, Richard W. (1963) Ph.D., University of Utah, 1960. Fluid Mechanics.
- Hedman, Paul O'Dell (1977) Ph.D., Brigham Young University, 1973. Combustion/Gasification, Fossil Energy, Reacting Flows, Chemical Propulsion.
- Rowley, Richard L. (1984) Ph.D., Michigan State University, 1978. Liquid-Mixture Transport Properties, Thermodynamics, Statistical Mechanics.
- Smoot, L. Douglas (1967) Ph.D., University of Washington, 1960. Combustion, Coal Gasification.
- Solen, Kenneth A. (1976) Ph.D., University of Wisconsin, Madison, 1974. Blood-Material Interactions, Blood Filtration, Microvascular Blood Flow.
- Terry, Ronald E. (1987) Ph.D., Brigham Young University, 1976. Enhanced Oil Recovery, Thermodynamics, Calorimetry, Process Control.

Associate Professors

- Hecker, William C. (1982) Ph.D., University of California, Berkeley, 1982. Catalysis, Chemical Kinetics, Fluidization, Coal and Oil Desulfurization, Auto Emissions Control.
- Oscarson, John L. (1974) Ph.D., University of Michigan, Ann Arbor, 1985. Vapor-Liquid Equilibria, Separation Processes, Corrosion.
- Smith, Philip (1982) Ph.D., Brigham Young University, 1979. Combustion and Transport, Processes in Reacting Flow Systems, Computer Modeling.

Assistant Professors

- Harb, John N. (1988) Ph.D., University of Illinois, 1988. Electrochemical Engineering, Coal Combustion, Mathematical Modeling.
- Pitt, William G. (1987) Ph.D., University of Wisconsin, Madison, 1987. Surface Chemistry, Blood-Surface Interactions, Protein Adsorption.

Graduate Programs and Degrees

Chemical Engineering (M.S.)
Engineering (Ph.D.)

Areas of Emphasis

Catalysis, fluid mechanics, calorimetry, transport properties, thermodynamics, blood material interactions, electrochemistry, combustion, process control, separations, materials.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Integrated Master's Program

See page 93 of this catalogue for a description of the integrated master's program in engineering. Special requirements for this program are basically the same as those for the M.S. degree in chemical engineering but include the following:

- I. Application requirements:
 - A. Formal application for admission submitted to the Office of Graduate Studies before completion of final 34 hours of combined graduate and undergraduate course work.
 - B. Cumulative GPA of 3.2 or higher at end of sophomore year.
- II. Degree requirements:
 - A. Cumulative GPA of 3.0 or above in all master's degree courses.
 - B. Submission of a final study list during first semester of registration as a graduate student that specifies all technical elective courses.

Program and Degree Requirements**Chemical Engineering (M.S.)****Admission and Entry**

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examinations:
 1. None for applicants who hold a B.S. from U.S. and Canadian schools.
 2. International applicants must submit general GRE and advanced engineering subject test as well as TOEFL scores.
- II. Prerequisite: B.S. degree (or equivalent) in chemical engineering from a school accredited by the American Institute of Chemical Engineers. A B.S. degree in other engineering fields, chemistry, physics, material science, or metallurgy requires provisional admission.
- III. Entry times: U.S. applicants, all terms and semesters; international applicants, fall semester only. In addition, applicants with a B.S. in a major other than chemical engineering must apply for summer term and arrive two weeks before the term begins.

Requirements for Degree

- I. Credit hours (34): Minimum 34 hours including 6–9 thesis hours (ChEn. 699R).
- II. Required courses: ChEn. 531, 533, 535, 691R (every semester) and electives (15–18 hours). For requirements of special programs, see departmental brochure.
- III. Residence: See preceding Engineering section.
- IV. Prospectus: Each student must submit a written prospectus on his or her proposed thesis topic.
- V. Thesis.
- VI. Examinations:
 - A. Comprehensive qualifying examination on graduate engineering course work to be taken and passed generally at the end of the first two semesters of the graduate program (see the department graduate handbook). The examination is offered twice a year.

- B. Oral defense of thesis.

Master of Engineering Management (M.E.M.)

See page 93 of this catalogue for a description of the interdisciplinary program in engineering management. M.E.M. students who wish to take classes in the Chemical Engineering Department should confer with the department graduate coordinator to be assigned an advisor.

Engineering (Ph.D.)**Admission and Entry**

- I. Deadlines: University deadlines apply.
- II. Entrance examinations:
 - A. None for applicants who hold a B.S. or M.S. degree from U.S. or Canadian schools.
 - B. International students must submit general GRE and advanced engineering subject test as well as TOEFL (575 minimum) scores.
- III. Prerequisite: B.S. degree (or equivalent) in chemical engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET) with a minimum GPA of 3.2 in the last 60 hours of technical and scientific course work. A B.S. in any other field requires provisional admission. Consult the department for specific details.
- IV. Entry times: U.S. applicants, all terms and semesters; international applicants, fall semester only. In addition, applicants with a B.S. in a major other than chemical engineering must apply for summer term and arrive two weeks before the term begins.

Requirements for Degree

- I. Credit hours: Minimum of 68 semester hours, at least 50 of which must be course work beyond the baccalaureate degree, plus 18 hours of dissertation (ChEn. 799R).
 - A. Candidates without a master's degree: Of the 50 hours, a minimum of 38 hours must be graduate-level courses. At least 12 hours of the 50 must be advanced mathematics, statistics, or science (a portion of which may be upper-division undergraduate level with specific department approval), and a minimum of 18 hours of dissertation (ChEn. 799R).
 - B. Candidates with a master's degree: With advisory approval, up to 20 hours of previous graduate work, including 4 hours of thesis, may apply toward the doctorate. In addition, other courses taken in the master's program may apply toward the required 12 hours of advanced mathematics, statistics, or science.
- II. Required courses: ChEn. 531, 533, 535, 791R (every semester), 12 hours of advanced mathematics, statistics, or science, and 30 hours of elective courses.
- III. Foreign language and skill requirement:
 - A. Students wishing to use language or a combination of language and skill subjects to meet this requirement should confer with the department.

- B. Students taking the skill option must complete at least 18 hours of integrated study in mathematics beyond college trigonometry (Math. 111 at BYU), statistics, or computer science. The 12 hours of advanced mathematics, statistics, or science required in item IA is in addition to this skill requirement.
- IV. Study list: The graduate study list must be submitted during the first semester of doctoral study.
- V. Residence: See preceding Engineering section of this catalogue.
- VI. Comprehensive Qualifying Examination: Students must take and pass a written Comprehensive Qualifying Examination based on graduate course work. The results of this examination are considered together with other performance criteria in evaluating the student for admission to candidacy.
- VII. Prospectus: Each student must submit and successfully defend a written prospectus on his or her proposed dissertation research topic at least one year before completion of the degree.
- VIII. Dissertation.
- IX. Oral defense of dissertation.

Combustion Engineering Minor

- I. Credit hours:
 - A. Master's level: 9 hours.
 - B. Doctoral level: 12 hours.
- II. Required courses: ChEn. 533, 591R (each semester in residence), 633, 733.
- III. Electives: Select from Chem. 759R, ChEn. 561, 641, 693R.
- IV. Research in combustion-related area.
- V. Examination: Comprehensive examination.

Chemical Engineering Graduate Courses

500. Creative Skills in Chemical Engineering. (1)

The application of creativity and technical knowledge from prior course work to the solution of relevant, open-ended problems.

518. Biomedical Engineering Principles. (3) Alt. yr.

Prerequisite: ChEn. 376, Math. 215.

The application of chemical engineering principles to model physiologic systems and to solve medical problems.

531. Thermodynamics of Multicomponent Systems. (3)

Prerequisite: ChEn. 373 or Chem. 461.

Fundamental concepts and applications in first and second laws, equilibrium and stability, phase equilibrium, and homogeneous and heterogeneous chemical equilibrium.

533. Transport Phenomena. (3)

Concurrent registration: ChEn. 476. Recommended: Math. 323.

Study of transport mechanisms and coefficients and of fundamental field equations for momentum, heat, and mass transport, with application to system design.

534. Advanced Separations. (3) Alt. yr.

Prerequisite: ChEn. 533, Math. 321.

General theory of differential and stagewise diffusional and separation operations, multicomponent distillation,

extraction, absorption, and application of this theory to solution of complex problems, including column design and instrumentation.

535. Kinetics and Catalysis. (3)

Prerequisite: ChEn. 478.

Theories and principles of chemical kinetics, including heterogeneous catalysis and reactor design.

536. Digital Process Control. (2)

Prerequisite: ChEn. 436.

Computer application of advanced control algorithms to chemical processes.

541. Computer Design Methods. (2) Alt. yr.

Prerequisite: Math. 311, ChEn. 376.

Computer-aided design and numerical methods of chemical engineering processes.

561. Instrumental Analysis of Fossil Fuels. (3)

Prerequisite: Chem. 461.

Spectroscopic, chromatographic, and other instrumental techniques for identifying and analyzing fossil fuels and related materials.

578. Polymer Science and Engineering. (3)

Prerequisite: introductory materials engineering course.

Fundamentals of polymer chemistry, physics, and their implications in engineering applications. Topics include polymerization chemistry, structure-property relationships, polymer physics, and transport properties.

591R. Combustion Seminar. (0.5)

Combustion-related technical presentations by faculty and invited speakers.

619. Electrochemical Engineering Fundamentals. (3) Alt. yr.

Prerequisite: ChEn. 376, 478.

Fundamentals of thermodynamics, transport phenomena, chemical kinetics, and systems analysis and their applications to corrosion, electrolysis, batteries, and water quality.

631. Applied Statistical Mechanics. (3) Alt. yr.

Prerequisite: Chem. 461; ChEn. 531 or equivalent.

Fundamentals of statistical mechanics and their application to calculating thermodynamic and transport properties of fluids and fluid mixtures.

633. Combustion Processes. (3)

Prerequisite: ChEn. 533 or equivalent.

Fundamentals of transport processes in reacting flow systems with specific applications of various combustion processes.

635. Advanced Topics in Catalysis and Kinetics. (1-3) On dem.

Prerequisite: ChEn. 535, Math. 321.

Specialty topics in catalysis and kinetics, including catalyst deactivation, catalyst characterization, reactor design, and reaction modeling.

641. Combustion Modeling. (3) Alt. yr.

Prerequisite: ChEn. 633, Math. 415.

Theory of combustion systems and quantitative procedures for computing performance of combustion chambers. Applications include turbulent combustion of gases, sprays, and particulates.

672. Advanced Fluid Mechanics. (3) Alt. yr.

Prerequisite: ChEn. 374 or equivalent. Recommended: Math. 323.

Application of field equations to the description of complex flow configurations and non-Newtonian flow.

674. Advanced Thermodynamics. (2) On dem.

Advanced thermochemistry applied to such topics as the measurements of heats of mixing, heats of reaction, and equilibrium constants.

678. Colloid and Surface Phenomena. (3) Alt. yr.

Prerequisite: ChEn. 578 or consent of instructor.

Introduction to the theory and applications of colloid and surface science. Topics include sedimentation, diffusion, colloid thermodynamics, viscosity, surface energy, adsorption, and flocculation.

685. Chemical Engineering for Chemistry Students. (6)

Intensive treatment of fundamentals of material and energy balances, fluid flow, and heat and mass transfer, with application to design and analysis of engineering systems.

691R. Seminar for Master's Students. (0.5)

Technical presentations by graduate students, faculty members, and guests.

693R. Special Topics—Graduate. (1–6)**697R. Special Problems—Graduate.** (2–6)**698R. Master's Project.** (1–6)**699R. Master's Thesis.** (1–6)**711. Advanced Environmental Analysis.** (3) On dem.

Prerequisite: consent of instructor.

Advanced concepts in environmental engineering related to combustion, with emphasis on technology affecting formation and control of SO_2 and NO_x . (Taught by University of Utah faculty.)

733. Coal Combustion. (3) Alt. yr.

Prerequisite: ChEn. 633, Math. 323.

Fundamentals of coal combustion and gasification processes, including particle mechanics, devolatilization, heterogeneous oxidation, radiative heat transfer, and combustion of coal in practical flames.

743. Properties and Reactions of Coals. (3) On dem.

Prerequisite: consent of instructor.

Structures, reactions, and properties of coal and coke. (Taught by University of Utah faculty.)

791R. Seminar for Doctoral Students. (0.5)**793R. Selected Topics in Chemical Engineering.** (1–3)

Topics vary according to student-faculty research interests.

799R. Doctoral Dissertation. (1–9)**Civil Engineering**

Chair: LaVere B. Merritt, 368-C CB, 378-2811

Graduate Coordinator: A. Woodruff Miller, 368-K CB, 378-6331

Faculty/Specialties**Professors**

Benzley, Steven Edward (1980) Ph.D., University of California, Davis, 1971. Structural Mechanics.
Budge, W. Don (1964) Ph.D., University of Colorado, Boulder, 1964. Transportation and Materials.
Christiansen, Henry N. (1965) Ph.D., Stanford University, 1962. Structural Mechanics and Computer Graphics.
Merritt, LaVere B. (1970) Ph.D., University of Washington, 1970. Environmental and Water Resources.
Miller, A. Woodruff (1974) Ph.D., Stanford University, 1975. Hydrology and Water Resources.
Wilson, Arnold (1957) Ph.D., Oklahoma State University, 1973. Structures and Concrete.
Youd, T. Leslie (1984) Ph.D., Iowa State University, 1967. Geotechnical Engineering.

Associate Professors

Balling, Richard J. (1982) Ph.D., University of California, Berkeley, 1982. Structural Mechanics.
Durrant, S. Olani (1970) Sc.D., New Mexico State University, 1969. Structures and Structural Mechanics.
Goodwin, Reese J. (1967) Ph.D., University of Utah, 1976. Structures.
Sederberg, Thomas W. (1978) Ph.D., Purdue University, 1983. Structural Mechanics.
Stephenson, Michael B. (1980) Ph.D., Brigham Young University, 1976. Structural Mechanics.
Thurgood, Glen S. (1967) Ph.D., Texas A&M University, 1975. Traffic and Transportation.
Wallace, Lynn P. (1983) Ph.D., West Virginia University, 1970. Water Resources and Surveying.

Assistant Professors

Borup, M. Brett (1987) Ph.D., Clemson University, 1985. Environmental Engineering.
Nay, Bruce J. (1984) Ph.D., Brigham Young University, 1981. Structural Mechanics and Computer Graphics.
Rollins, Kyle M. (1987) Ph.D., University of California, Berkeley, 1987. Geotechnical Engineering.

Graduate Programs and Degrees

Civil Engineering (M.S.)
Engineering Management (M.E.M.)
Engineering (Ph.D.)

Areas of Emphasis

Geotechnical engineering, structures and structural mechanics, transportation engineering, water resources and environmental engineering, engineering management (M.E.M. degree only).

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Integrated Master's Program

See page 93 of this catalogue for a description of the integrated master's program in engineering. Special requirements for this program are basically the same as those for

the M.S. degree in civil engineering but include the following:

- I. Application requirements:
 - A. Formal application for admission submitted to the Office of Graduate Studies before completion of final 30 hours of graduate degree.
 - B. Cumulative GPA of 2.5 or better in civil engineering program at end of sophomore year.
- II. Degree requirements:
 - A. Cumulative GPA of 3.0 or above in all master's degree courses.
 - B. Submission of final study list during first semester of registration as a graduate student.

Program and Degree Requirements

Civil Engineering (M.S.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examinations:
 1. None for applicants who hold a B.S. from U.S. or Canadian schools.
 2. International applicants must submit general GRE for advanced engineering subject test as well as TOEFL scores.
- II. Prerequisite: Baccalaureate degree in civil engineering or its equivalent (students with other backgrounds will also be considered). Student will be required to make up any deficiencies.

Requirements for Degree

- I. Credit hours (34 minimum):
 - A. Thesis program: 34 minimum approved hours including 6-9 thesis hours (CivE. 699R).
 - B. Project program: 34 minimum approved hours including a maximum of 3 project hours.
- II. Required course: CivE. 691R each fall and winter semester; no more than 1.0 hour can count toward the minimum hours required. Consult department for details.
- III. Residence: See preceding Engineering section.
- IV. Examinations:
 - A. Successful completion of the fundamentals examination (FE), formerly the engineering-in-training (EIT) examination.
 - B. Oral defense of thesis or oral presentation of project.

Master of Engineering Management (M.E.M.)

See page 93 of this catalogue for a description of the interdisciplinary program in engineering management. M.E.M. students who wish to take classes in the Civil Engineering Department should consult the department graduate coordinator to be assigned an advisor.

Engineering (Ph.D.)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Entrance examinations:

- A. None for applicants who hold a B.S. or M.S. degree from U.S. or Canadian schools.
 - B. International students must submit general GRE and advanced engineering subject test as well as TOEFL (575 minimum) scores.
- III. Prerequisite: B.S. degree (or equivalent) in civil engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET) with a minimum GPA of 3.4 in the last 60 hours of technical and scientific course work. A B.S. in any other field requires provisional admission. Consult the department for specific details.

Requirements for Degree

- I. Credit hours: Minimum of 68 semester hours, at least 50 of which must be course work beyond the baccalaureate degree, plus 18 hours of dissertation (CivE. 799R).
 - A. Candidates without a master's degree: Of the 50 hours, a minimum of 38 hours must be graduate-level courses. At least 12 hours of the 50 must be advanced mathematics, statistics, or science (a portion of which may be upper-division undergraduate level with specific department approval), and a minimum of 18 hours of dissertation (CivE. 799R).
 - B. Candidates with a master's degree: With advisory approval, up to 20 hours of previous graduate work, including 4 hours of thesis, may apply toward the doctorate. In addition, other courses taken in the master's program may apply toward the required 12 hours of advanced mathematics, statistics, or science.
- II. Required course: CivE. 691R (graduate seminar) each fall and winter semester; no more than 2 hours can count toward minimum hours required.
- III. Foreign language and skill requirement:
 - A. Students wishing to use language or a combination of language and skill subjects to meet this requirement should confer with the department.
 - B. Students taking the skill option must complete at least 18 hours of integrated study in mathematics beyond college trigonometry (Math. 111 at BYU), statistics, or computer science. The 12 hours of advanced mathematics, statistics, or science required in item IA is in addition to this skill requirement.
- IV. Study list: The graduate study list must be submitted during the first semester of doctoral study.
- V. Residence: See the preceding Engineering section of this catalogue.
- VI. Comprehensive Qualifying Examination: Students must take and pass a written Comprehensive Qualifying Examination based on graduate course work. After passing this examination, the student is accepted to candidacy for the doctoral degree. The examination is offered twice a year and is generally taken at the end of the first two semesters of the graduate program.
- VII. Prospectus: Students must submit and successfully defend a written prospectus on their proposed dissertation research topic at least one year before completion of the degree.

- VIII. Dissertation.
IX. Oral defense of dissertation.

Civil Engineering Graduate Courses

500. (CivE.—MeEn.) Design and Materials Applications. (3)

Prerequisite: CivE. 203; MeEn. 372 or CivE. 321

Applied and residual stress; materials selection; static, impact, and fatigue strength; fatigue damage; surface treatments; elastic deflection and stability—all as applied to mechanical design.

501. (CivE.—MeEn.) Stress Analysis and Design of Mechanical Structures. (3)

Prerequisite: CivE. 321 or MeEn. 372.

Stress analysis and deflection of structures; general bending and torsion with computer applications to mechanical and aerospace structure design.

502. (CivE.—MeEn.) Plasticity and Fracture Mechanics. (3)

Prerequisite: CivE./MeEn. 503.

Continuum theory of plasticity; linear elastic fracture mechanics, introduction to structured continuum theories for polycrystalline media.

503. (CivE.—MeEn.) Theory of Elasticity. (3)

Prerequisite: CivE. 203, Math. 321.

Tensor notation, stress and deformation tensors, constitutive equations, field equations; plane-stress/plane strain, axisymmetric, thermoelasticity, and large deformation problems.

504. (CivE.—MeEn.) Matrix Structure Analysis. (3)

Prerequisite: CivE. 321 or MeEn. 372.

Matrix notation, principle of virtual forces, flexibility method, principle of virtual displacements, stiffness method, and general purpose computer programs for structural analysis.

505. Materials, Uses, and Properties of Concrete. (3)

Prerequisite: consent of instructor.

Manufacturing and testing of cements; concrete materials and concrete mix design; and techniques of concrete handling, placing, and treatment, including laboratory work.

506. (CivE.—MeEn.) Introduction to Finite Element Method. (3)

Prerequisite: CivE. 321 or MeEn. 372.

Finite element stress analysis; mathematical foundations; simplex, isoparametric, bending and axisymmetric elements; basic 2-D and 3-D modeling techniques; use of FEA computer software and hardware.

507. (CivE.—MeEn.) Advanced Finite Element Analysis. (3)

Prerequisite: CivE.—MeEn. 506.

Complex 3-D finite modeling, multiple element types, and mesh generation techniques. Application to thermal stress, nonlinear materials, and large deformations. Use of CAE software.

508. (CivE.—MeEn.) Dynamics of Structures and Mechanical Systems. (3)

Prerequisite: Math. 321; CivE. 321 or MeEn. 372.

Dynamic analysis of single and multi-degree-of-freedom systems, Ritz approximation, frequency domain analysis, geometric nonlinearity, and material nonlinearity.

509. (CivE.—MeEn.) Spectral Analysis of Dynamic Systems. (3)

Prerequisite: Math. 321, CivE. 204.

Vibrations of elastic bodies and of systems with multiple degrees of freedom; random vibration. Computer-aided vibration testing and analysis.

513. (CivE.—Geog.) Photogrammetry and Remote Sensing. (3)

Prerequisite: CivE. 113.

Using data obtained from the visible range (photographs) and broader ranges (radar, microwaves, infrared, remote, etc.) of the electromagnetic spectrum to solve engineering problems with mapping procedures; photo and electronic data interpretation.

524. Design of Bridge Structures. (3)

Prerequisite: CivE. 423, 424, 441, 504.

Design of bridge composite; continuous beam and girder bridges including piers, abutments, floor systems, and bearings; field trips to observe bridge construction and fabrication.

526. Prestressed Concrete. (3)

Prerequisite: CivE. 424, 504.

Basic theory, methods of pre- and post-tensioning, and details of design and fabrication applications to continuous structures.

529. Timber Design. (3)

Prerequisite: CivE. 321.

Timber species, composition, and grades; design of beams, straight and tapered glue-lam girders, columns, connections, trusses, shear walls, and structural systems.

531. Water Resources Engineering. (3)

Prerequisite: CivE. 431, 433.

Advanced hydrologic and hydraulic principles in planning and designing irrigation, drainage, flood control, and other water resource facilities.

535. Hydraulic Design of Channels and Control Structures. (3)

Prerequisite: CivE. 431, 433.

Design of water conveyance channels and control structures, including siphons, chutes, weirs, flumes, dams, spillways, and outlet works.

542. Foundation Engineering. (3)

Prerequisite: CivE. 441.

Integrating soil mechanics and structural design to elementary structures, including spread footings, combined footings, mat foundations, retaining walls, pile foundations, and caissons.

543. Earth- and Rock-Fill Structures. (3)

Prerequisite: CivE. 441 or equivalent.

Design and construction of earth- and rock-fill dams, including selecting dam sites and materials, and applying seepage and pore pressure studies, shearing strength data, stability analysis, and construction controls.

545. Geotechnical Analysis of Earthquake Phenomena. (3)

Prerequisite: CivE. 321, 441.

Earthquake magnitude and intensity potential; design ground motions, elementary dynamics of structures; response spectra; building code provisions; liquefaction and ground failure.

550. Water Quality Management. (3)

Prerequisite: CivE. 351.

Philosophies, objectives, and methods of water quality management, including impact of various uses on water quality and behavior of pollutants in receiving waters.

555. Sanitary Engineering Analysis. (3)

Prerequisite: CivE. 351 or equivalent.

Techniques for chemical and biological analysis of major organic and inorganic constituents of water, sewage, and industrial wastes.

561. Geometric Design of Highways. (3)

Prerequisite: CivE. 361.

Designing visual aspects of highways; highway classification, design controls and criteria, and design elements; vertical and horizontal alignment, cross sections, intersections, and interchanges; capacity analysis.

562. Characteristics and Operations of Traffic Engineering. (3)

Prerequisite: CivE. 361 or equivalent.

Traffic flow theory operations and characteristics, including drivers, vehicles, parking facilities at-grade intersections, channelization, traffic control devices, signals.

563. Pavement Design. (3)

Prerequisite: CivE. 361.

Properties and selection of pavement components, including soils, stabilized soil, base, subbase, subgrade, and bituminous materials, along with design of rigid and flexible pavements.

565. Transportation in Urban Planning. (3)

Prerequisite: consent of instructor.

Street classification and function; design elements of streets, intersections, and access drives; transportation planning studies; land use transportation interrelationships and improvement alternatives.

570. (CivE.—MeEn.) Computer-aided Engineering Software Design. (3)

Prerequisite: FORTRAN or similar computer language.

Programming techniques and structure for interactive engineering design software. Use of engineering library utility routines for computer graphics, data access, and user interface. Term project required.

571. (CivE.—MeEn.) Engineering Computer Graphics and Software Design. (3)

Prerequisite: FORTRAN or similar computer language.

Application of modern computer graphics techniques to engineering problems: 2-D and 3-D transformations, perspective, hidden surface removal, lighting, and shading. Graphics data structures, standards, and device independence. Software design methodology. Term project required.

572. (CivE.—MeEn.) Computer-aided Geometric Design. (3)

Prerequisite: FORTRAN or similar computer language.

Mathematical theory of free-form curves and surfaces and solid geometric modeling. Bezier and B-spline curve and surface theory, parametric and implicit forms, intersection algorithms, topics in computer algebra, free-form deformation. Several programming projects required.

575. (CivE.—MeEn.) Optimization Techniques in Engineering. (3)

Prerequisite: Math. 321 and FORTRAN or similar computer language.

Application of nonlinear and discrete optimization techniques to constrained engineering design. Theory and use of state-of-the-art computer routines.

621. Design of Thin Shell Structures. (3)

Prerequisite: CivE. 424, 504.

Analysis of domes, cylindrical, folded plate, and hyper shells and the design of typical structures of reinforced concrete.

625. Design of Multistory Structures. (3)

Prerequisite: CivE. 423, 424, 441, 504, or consent of instructor.

Design of shear walls, floors, columns, frames, and foundations, using elastic and plastic methods, including frame response to lateral forces.

641. Advanced Soil Mechanics. (3)

Prerequisite: CivE. 441.

Theory of elasticity applied to soil; stress distribution in earth masses; strength and soil consolidation theories; settlement analysis, stability of slopes, and bearing capacity of soils.

644. Advanced Foundation Engineering. (3)

Prerequisite: CivE. 641.

Dewatering problems; shallow, pile, caisson, and machine foundations; foundations on collapsible and expansive soils; liquefaction under seismic activity.

646. Flow of Fluids Through Porous Media. (3)

Prerequisite: CivE. 441.

Steady state fluid flow in soils; confined and unconfined transient flow in soils; subsurface drainage; design of subsurface dams.

650. Unit Operations and Processes. (3)

Prerequisite: CivE. 433.

Water and wastewater applications of unit operations and processes.

651. Water Treatment Facilities Design. (3)

Prerequisite: CivE. 650.

Analysis and design of water and wastewater treatment facilities.

654. Industrial Waste Treatment. (3)

Prerequisite: CivE. 650.

Treatment and disposal of industrial wastes; basic industries and their waste problems.

662. Traffic Simulation and Analysis. (3)

Prerequisite: CivE. 562 or consent of instructor.

Simulating and analyzing highway capacity, traffic flow, and traffic control problems; potential solutions using computer models.

691R. Civil Engineering Seminar. (0.5)

694R. Selected Problems in Civil Engineering. (1-3) F, W, Sp, Su

698R. Master's Project. (1-6)

Prerequisite: consent of instructor and/or master's graduate committee.

699R. Master's Thesis. (1-9)

794R. Selected Topics in Civil Engineering. (1-3) F, W, Sp, Su

797R. Research for Doctoral Students. (1-9)

799R. Doctoral Dissertation. (1-9)

Electrical and Computer Engineering

Chair: David J. Comer, 459 CB, 378-4012

Faculty/Specialties

Professors

Berrett, Paul O. (1964) Ph.D., University of Utah, 1965. Microwave and Antenna Theory, System Analysis, Applied Electromagnetics.

Bowman, Lawrence S. (1967) Ph.D., University of Utah, 1964. Computers, Microwave Semiconductors.

Chabries, Douglas M. (1978) Ph.D., Brown University, 1970. Digital Signal Processing, Adaptive Filtering, Image and Sonar Processing.

Christiansen, Richard (1978) Ph.D., University of Utah, 1976. Digital Signal Processing, Image Processing, Neural Networks, Communication and Information Theory, Pattern Recognition.

Clegg, John C. (1961) Ph.D., University of Utah, 1957. Electronics, High Frequency, Electronic Circuits and Power Electronics.

Comer, David John (1981) Ph.D., Washington State University, 1966. Robotic Vision Systems, Microprocessor Applications.

Humpherys, Deverl S. (1964) Ph.D., University of Illinois, 1963. Electronics and Circuit Theory.

Miner, Gayle F. (1960) Ph.D., University of California, Berkeley, 1969. Electromagnetic Theory, Fiber Optics, Data Acquisition.

Woodbury, Richard C. (1959) Ph.D., Stanford University, 1965. Semiconductor and Magnetic Devices.

Associate Professors

Bearson, Leroy Wood (1972) Ph.D., Auburn University, 1970. Computer Communication, Error Correction, Networking.

Nelson, Brent E. (1984) Ph.D., University of Utah, 1984. VLSI Design, Computer Systems Design.

Salmon, Linton G. (1990) Ph.D., Cornell University, 1983. Integrated Circuit Processing and Modeling, High-Speed Packaging, III-V Devices.

Stirling, Wynn (1984) Ph.D., Stanford University, 1983.

Linear System Theory, Estimation and Detection Theory, Communications and Information Theory.

Ware, Gene A. (1987) Ph.D., Utah State University, 1980. Communications, Digital Systems, Microprocessors.

Assistant Professors

Archibald, James K. (1987) Ph.D., University of Washington, 1987. Computer Architecture, Parallel Processing.

Frost, Richard L. (1987) Ph.D., University of Utah, 1979. Digital Signal Processing, Information Theory, Image Processing, Neural Networks.

Jeffs, Brian D. (1990) Ph.D., University of Southern California, 1989. Digital Signal Processing, Digital Image Processing, Biomedical Imaging.

Long, David G. (1990) Ph.D., University of Southern California, 1989. Digital Signal Processing, Estimation Theory, Radar.

Selfridge, Richard H. (1987) Ph.D., University of California, Davis, 1984. Fiber and Integrated Optics, Electromagnetics, Lasers.

Swindlehurst, Arnold Lee (1990) Ph.D., Stanford University, 1990. Detection and Estimation Theory, Linear Systems and Control.

Graduate Programs and Degrees

Electrical Engineering (M.S.)

Engineering (Ph.D.)

Areas of Emphasis

Department research is focused in three general areas as follows:

1. Computer engineering, which includes computer systems organization, VLSI design, and CAD and computer communications.
2. Electro-sciences, which includes semiconductor devices and electromagnetics/electro-optics.
3. Signals and systems, which includes digital signal processing, communication theory, and estimation/control theory.

Financial Assistance

Note: Students on probation are not eligible for financial assistance in any form from the Electrical and Computer Engineering Department.

General University Requirements

See the General Information section of this catalogue for university requirements that apply to all departments. For additional information on department procedures, requirements, academic standards and expectations, scholarships, and financial assistance, consult the department graduate secretary.

Program and Degree Requirements

Electrical Engineering (M.S.)

Admission and Entry

I. Application requirements:

- A. Deadlines: University deadlines apply.
- B. Entrance examination: The GRE test is required of applicants with degrees from institutions that have not been accredited by ABET.

- II. Entry times: International students will be admitted only for fall semester. The department will adhere to the application deadlines published in this catalogue. Admission decisions concerning international students will be made in April. All other students may be admitted for any semester or term.
- III. Prerequisite: B.S. degree in electrical and/or computer engineering from an ABET-accredited institution with minimum GPA of 3.0 for last 60 hours and for all technical course work (such as mathematics, physics, engineering), or, with department consent, a B.S. degree in an allied discipline from an accredited institution or a B.S. degree in electrical and/or computer engineering from a nonaccredited institution with a minimum GPA of 3.2 for last 60 hours and for all technical course work. Applicants with a baccalaureate degree in an allied discipline must have completed a minimum of 36 credit hours in mathematics, physics, computer science, and engineering before being considered for admission. Interested students may consult the department secretary for a list of required courses.
- IV. Provisional admission: Applicants may be admitted provisionally but will generally be required to complete remedial work. Students admitted provisionally who fail to meet all the provisions of acceptance by the end of their first semester or term are automatically placed on departmental probation and will have one semester to clear the probational status or their graduate degree program will be terminated.

Requirements for Degree

- I. Credit hours: Minimum 34 course work hours.
- II. Required courses: (Note: Although the following courses are allowed, students must receive the approval of the graduate advisory committee and the graduate coordinator before any of the courses can apply toward their graduate degree.)
 - A. ECEn. 691R (a minimum of two semesters).
 - B. Mathematics/statistics courses: 6 hours from Math. 323, 332, 350, 355, 371, 372, 411, 415, 480, 512, 513R, 521, 530, 541, 542, 543, 585, Phscs. 517, 518, Stat. 521, 545.
 - C. Electrical engineering courses: A minimum of 18 credit hours of 500- and 600-level electrical and computer engineering courses except seminars and thesis courses is required. Nine of these credit hours must be from the following list of restricted electives: ECEn. 511, ECEn. 513, ECEn. 521, ECEn. 523, ECEn. 560, Phscs. 551.
 - D. Thesis option: 6–9 hours of ECEn. 699R.
- III. Electives: Selected from above list or from following (or others) as approved by advisory committee and graduate coordinator: ECEn. 420, 432, 444, 460; CS 510, 521, 531, 551, 555, 560, 561, 581; ChEn. 582, 583; Phscs. 481, 551, 561, 562, 565, 566, 581; MeEn. 534, 575, 631.
- IV. Study list: The graduate study list must be submitted by the end of the fourth week of the entry semester. Failure to submit the study list on time will cause the student's registration to be placed on hold for the succeeding semester or term.

V. Residence: See preceding Engineering section.

VI. Examinations:

- A. Thesis program—oral defense of thesis.
- B. Nonthesis program—final comprehensive written examination over master's course work.

VII. Thesis (for thesis option candidates).

- VIII. Grades: No class on an approved study list may be repeated to raise the grade. The first grade received in the class will be used in computing the graduate GPA. Once a course listed on an approved study list has been taken, the course may not be removed from the study list.

Master of Engineering Management (M.E.M.)

See page 93 of this catalogue for a description of the interdisciplinary program in engineering management. M.E.M. students who wish to take classes in the Electrical and Computer Engineering Department should consult the department graduate coordinator.

Engineering (Ph.D.)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Entrance examinations:
 - A. None for applicants who hold a B.S. or M.S. degree from U.S. or Canadian schools.
 - B. International students must submit general GRE and advanced engineering subject test as well as TOEFL (575 minimum) scores.
- III. Prerequisite: B.S. degree (or equivalent) in electrical and/or computer engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET) with a minimum GPA of 3.0 in the last 60 hours of technical and scientific course work. A B.S. in any other field requires provisional admission. Consult the department for specific details.
- IV. Entry times: Fall, winter, spring, or summer for U.S. students; fall only for international students.

Requirements for Degree

- I. Credit hours: Minimum of 68 semester hours, at least 50 of which must be course work beyond the baccalaureate degree, plus 18 hours of dissertation (ECEn. 799R).
- A. Candidates without a master's degree: Of the 50 hours, a minimum of 38 hours must be graduate-level courses. At least 12 hours of the 50 must be advanced mathematics, statistics, or science (a portion of which may be upper-division undergraduate level with specific department approval), and a minimum of 18 hours of dissertation (ECEn. 799R).
- B. Candidates with a master's degree: With advisory approval, up to 20 hours of previous graduate work, including 4 hours of thesis, may apply toward the doctorate. In addition, other courses taken in the master's program may apply toward the required 12 hours of advanced mathematics, statistics, or science with department approval.
- II. Required courses: ECEn. 791R each semester of residence.

- III. Electives: Determined in consultation with advisory committee.
- IV. Foreign language and skill requirement:
 - A. Students wishing to use language or a combination of language and skill subjects to meet this requirement should confer with the department.
 - B. Students taking the skill option must complete at least 18 hours of integrated study in mathematics beyond college trigonometry (Math. 111 at BYU), statistics, or computer science. The 12 hours of advanced mathematics, statistics, or science required in item IA is in addition to this skill requirement.
- V. Study list: The graduate study list must be submitted during the first semester of doctoral study.
- VI. Residence: See preceding Engineering section of this catalogue.
- VII. Comprehensive Qualifying Examination: Students must take and pass a written Comprehensive Qualifying Examination based on graduate course work.
- VIII. At the option of the department, an oral research report on an assigned topic may be required within one year of passing the Comprehensive Qualifying Examination. Upon presentation of an acceptable report, the student is advanced to candidacy for the doctoral degree.
- IX. Prospectus: Students must submit and successfully defend a written prospectus on their proposed dissertation research topic at least one year before completion of the degree.
- X. Dissertation.
- XI. Oral defense of dissertation.
- XII. Maximum completion time: All course work for the Ph.D. degree beyond that used for the M.S. degree must be completed within seven years.

Electrical and Computer Engineering Graduate Courses

511. Introduction to Linear System Theory. (3)

Prerequisite: ECEn. 314; Math. 343 or 215.

Finite-dimensional linear systems. State variable realizations, canonical forms, controllability, observability, minimality. Time and frequency domain design of controllers and observers.

512. Active and Passive Filter Design. (3)

Prerequisite: ECEn. 314.

Design and frequency response characteristics of active and passive filters with emphasis on applications to signal processing.

513. Signal Analysis in Linear Systems. (3)

Prerequisite: ECEn. 314 or graduate standing.

Continuous and discrete signals in linear systems, using Laplace, Fourier, and Z-transforms. Sampling, simulation, analog and discrete filters, FFT, windowing, and signal reconstruction.

514. Digital Signal Processing Laboratory 1. (1)

Prerequisite: ECEn. 513 or concurrent registration.

Testing signal processing algorithms and concepts using digital computer. Discrete convolution, DFT, and digital filters.

515. Data Acquisition Systems. (3)

Prerequisite: ECEn. 313, 314.

Components and their characteristics required to convert physical variables to digital data. Relationship between digital data word bit size and component characteristics.

516. Adaptive Processing. (2)

Prerequisite: ECEn. 513.

Adaptive digital filter theory, LMS adaptive algorithms, applications to learning filters, noise cancellation, and adaptive antenna arrays.

517. Digital Filters and Signal Processing. (3)

Prerequisite: Math. 322, ECEn. 513.

Digital filters and their application to signal processing.

518. Digital Signal Processing Laboratory 2. (1)

Prerequisite: ECEn. 517 or concurrent registration.

Advanced laboratory experience in computer processing of digital signals and signals in discrete format.

519. Digital Image Processing. (3)

Prerequisite: ECEn. 513.

Digital processing techniques for two-dimensional scene analysis, classification feature enhancement, contrast enhancement deblurring, data compression, etc.

520. Error-correcting Codes. (3)

Prerequisite: ECEn. 324.

Methods, costs, and payoffs of various codes for correcting errors in digital systems.

521. Theoretical Foundations of Computing (3)

Prerequisite: ECEn. 323 or 451.

Introduction to finite automata, formal grammars, Turing machines, algorithm analysis, and computational complexity.

522R. Special Topics in Computer Systems. (1-3)

Prerequisite: consent of instructor.

523. Computer Network Queuing. (3)

Prerequisite: ECEn. 513 concurrently and Stat. 321 or 421.

Queuing concepts related to computer systems and networks, resource allocation, speed, service time. Applications of random variables and probability theory.

525. Design Automation. (3)

Prerequisite: ECEn. 324.

Algorithms for cost-effective payoffs, simulation, and fault testing of digital electronics.

526. Local Computer Networks. (3)

Prerequisite: ECEn. 327.

Local computer network coupling fundamentals.

528. Computer Systems Architecture. (3)

Prerequisite: ECEn. 423.

Advanced topics in computer architecture and parallel processing.

529R. Advanced Computer System Design Lab. (3)

Prerequisite: ECEn. 423, 451.

Lab experience in design and analysis of advanced computer systems.

531. Power Systems Analysis. (3) Alt. yr.
Prerequisite: ECEn. 432.

Polyphase circuits, transmission line constants, power system representation, generalized circuit constants, symmetrical components, and fault studies.

532R. Special Topics in Power Systems. (3)

533. Power Machinery and Equipment. (3)
Prerequisite: ECEn. 306 or 331.

Transformers, synchronous and induction AC machines, DC machines, fractional horsepower and control motors, polyphase rectifiers, introduction to machine dynamics.

536. Commercial and Industrial Power Systems. (3) Alt. yr.
Prerequisite: ECEn. 331.

Design of commercial and industrial power systems and equipment; design of illuminating systems; preparation of specifications that conform to the National Electrical Code.

542R. Special Topics in Electronics. (1-3)
Prerequisite: consent of instructor.

544. Digital Communication Theory. (3)
Prerequisite: ECEn. 444.

Theory and design of optimal digital communication systems with noise, matched filters, correlation detectors, convolution codes, sequential coding/decoding schemes, block coding, and spread spectrum.

545. Information and Coding Theory. (3)
Prerequisite: ECEn. 314, Stat. 421.

Mathematical development of information and coding theory applied to communication and other stochastic processes.

546. Optical Communication Components and Systems. (3)
Prerequisite: ECEn. 314, 460.

Fiber optic communication system components and their operating and performance characteristics.

550. Device Electronics for Integrated Circuits. (4)
Prerequisite: ECEn. 450.

Semiconductor device analysis and simulation. Analog integrated circuit design.

551. VLSI Systems Design. (3)
Prerequisite: ECEn. 451.

Design of structured circuit systems for very large-scale integrated semiconductor chips. Architecture of digital VLSI systems.

553. VLSI Process Technology. (3)
Prerequisite: senior or graduate standing in engineering or physical sciences.

Physical and chemical process steps used in fabricating very large-scale integrated circuits on monolithic silicon crystal.

555. VLSI Testing. (1)
Prerequisite: ECEn. 451.

Testing of ICs designed previous semester in ECEn. 451. Topics in VLSI-testable circuit designs.

560. Intermediate Electromagnetic Theory. (3)
Prerequisite: Math. 322 or 332; ECEn. 460.

Application of electromagnetic theory to nonlinear and anisotropic materials and devices. Current mathematical techniques in field theory.

561. High-Frequency Communication Circuits. (4)
Prerequisite: ECEn. 360, 442.

Circuits and RF techniques used in communication systems.

563. Antenna Theory. (3) Alt. even yr.
Prerequisite: ECEn. 460.

Radiation, terminal, and distributed properties of antenna structures. Effects of lossy and ionized media on antenna performance. Noise temperature.

564. Radar Systems Performance. (3)
Prerequisite: ECEn. 442, 460.

Performance and evaluation of various radar systems. Range equation, signal detection, ambiguity function, system configurations, and components.

593R. Special Topics in Electrical Engineering. (3)
Prerequisite: consent of instructor.

Topics vary. Recent developments in electrical engineering.

598R. Special Problems. (3)
Prerequisite: consent of instructor.

644. Pattern Recognition. (3)
Prerequisite: ECEn. 513; Stat. 321 or 421.

Decision surfaces and Bayesian theory applied to multi-dimensional pattern analysis and recognition with and without training data.

646. Optimal Estimation Theory. (3)
Prerequisite: ECEn. 544.

Optimal filtering techniques, including Wiener and Kalman filtering. Estimating signal parameters in noise.

661. Advanced Electromagnetic Fields. (3) Alt. odd yr.
Prerequisite: ECEn. 560.

Physical interpretation of electromagnetic fields. Mathematical methods of solving boundary value and other field problems.

691R. Graduate Seminar. (0.5)

Technical presentations by graduate students, faculty members, and invited guests.

699R. Master's Thesis. (1-9)
Prerequisite: graduate standing and consent of major professor.

791R. Seminar for Doctoral Students. (1)

794R. Selected Topics in Electrical and Computer Engineering. (1-3)

797R. Research for Doctoral Students. (1-9)

799R. Doctoral Dissertation. (1-9)

Manufacturing Engineering and Engineering Technology

Chair: John J. Kunzler, Jr., 435 CTB, 378-6300

Graduate Coordinator: A. Brent Strong, 435 CTB, 378-3984

Faculty/Specialties

Professors

Allen, Dell K. (1960) Ed.D., Utah State University, 1973.

Computer-integrated Manufacturing, Group Technology.

Associate Professors

Holt, Ivin L. (1963) Ed.D., Arizona State University, 1972.
Prototype Fabrication, Industrial Electronics.

Kunzler, John J., Jr. (1971) M.S., Brigham Young University, 1980. Computer-integrated Manufacturing, Manufacturing Systems.

Red, W. Edward (1983) Ph.D., Arizona State University, 1972. Robotics, Automation, Applied Mechanics.

Smart, Merrill J. (1967) M.S., University of Utah, 1962. Real-Time Computer Systems.

Strong, A. Brent (1986) Ph.D., University of Utah, 1971. Composites, Plasma Surface Treatments, Plastics.

Todd, Robert H. (1989) Ph.D., Stanford University, 1971. Mechanical Engineering Design.

Assistant Professors

Carter, Perry W., II (1980) M.S., Brigham Young University, 1974. Automatic Assembly.

Harrell, Charles R. (1982) Ph.D., University of Denmark, 1988. Simulation.

Hawks, Val D. (1985) M.I.E., Lehigh University, 1986. CIM Database Management Systems.

Helps, C. Richard G. (1986) M.S.E.E., Witwatersrand University, Johannesburg, South Africa, 1986. Real-Time, Process Control, Automation Systems.

Kohkonen, Kent E. (1970) M.S., Brigham Young University, 1976. CNC Software Development, Processing Languages, Parametric Programming, Tool Database Development, Plastic.

Mather, C. Glayd (1974) M.S., Utah State University, 1965. Information Transmission, Light Frequency Systems.

Owen, Earl F. (1982) M.S., University of Utah, 1972. RF Microwave Circuits.

Sorensen, Carl D. (1987) Ph.D., Massachusetts Institute of Technology, 1985. Design for Manufacture, Manufacturing Processes.

Whited, Charles R. (1969) M.S., University of Utah, 1957. Real-Time Software, Process Control.

Graduate Programs and Degrees

Computer-integrated Manufacturing (M.S.)

Master of Technology Management (M.T.M.)

Areas of Emphasis

See faculty specialties.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Computer-integrated Manufacturing (M.S.)

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examinations:

1. General GRE with score of 1650 (combined Q,V,A score) recommended.

2. TOEFL score of 575 for all international applicants whose native language is not English.

C. GPA: Must be 3.0 or higher.

D. Consult graduate coordinator for additional information.

II. Prerequisite:

A. Baccalaureate degree in engineering, engineering technology, or a related field with department approval.

B. Basic sciences background needed, along with engineering, mathematics, and modern manufacturing methods.

C. All prerequisites must be completed before entrance into the program. Students must make up any deficiencies after consultation with a graduate faculty member and approval from the department.

Requirements for Degree

I. Credit hours (34): Minimum 25 course work hours plus 9 thesis hours (MfET 699R).

II. Required courses:

A. Core classes: MfET 529, 533, 534, 572.

B. Graduate Seminar: MfET 599R (.5 each semester, 1 hour total).

III. Electives: Minimum 12 hours from approved courses. The electives must include one mathematics course above integral calculus or one approved statistics course (unless satisfied before entering program).

IV. Thesis: Minimum 9 thesis hours.

VI. Examinations:

A. Student must pass a comprehensive examination on course work.

B. Oral defense of thesis.

Master of Technology Management (M.T.M.)

See page 93 of this catalogue for a description of the interdisciplinary program in engineering management. M.T.M. students who wish to take classes in the Manufacturing Engineering and Engineering Technology Department should consult the department graduate coordinator.

Industrial Computer-integrated Manufacturing (CIM) Program

An accelerated program is available to certain industrial employees who are graduates in engineering, engineering technology, or related fields. The program allows candidates to earn a master's degree in five summer terms of five weeks each and requires a project (MfET 698R, 3 credits). Consult the graduate coordinator for more information.

Manufacturing Engineering and Engineering Technology Graduate Courses

Note: Most graduate-level courses in this department are offered once per year.

501. Fundamentals of Manufacturing Processes, Design, and Materials. (3)

Prepares students in Industrial CIM Program for core CIM courses.

528. Electronic Fabrication and Assembly. (3)

Prerequisite: EET 314 or equivalent and consent of instructor.

Theory and application of manufacturing processes required to produce electronic equipment.

529. Manufacturing Information Processing and Networks. (3)

Prerequisite: Phscs. 221, EET 443.

Function and system analysis and application for sensing, sending, and processing manufacturing information; metallic and lightwave technology networking; data, media, standards, topologies, protocols, instrumentation, and integration.

532. Group Technology. (3)

Prerequisite: MET 332 or consent of instructor.

Classification theory and practice applied to workpiece classification and coding, statistics, cellular production, design retrieval, and generative process planning, emphasizing computer application.

533. Computer-integrated Manufacturing. (3)

Prerequisite: MFE 480, 362.

Basic activities, elements, and principles of computer-aided manufacturing, including terminology, systems integration, architecture, database development, interfaces, and computer hardware and software requirements.

534. Automation. (3)

Determining appropriate levels of manufacturing automation based on economics and productivity. Elements of automation, including sensors, robots, conveyors, and part feeders.

536. Advanced Process Mechanics. (3)

Prerequisite: MeEn. 337.

Modern methods of analysis applied to material processing.

537. Advanced Mechanisms. (3)

Prerequisite: MeEn. 337.

Kinematics and dynamics of advanced mechanisms, such as robots, with computer simulation of their motion.

538. Technical Management. (3)

Techniques and tools for effective project management. Management, analysis, cost justification, and communication skills within manufacturing or engineering environments.

540. Computer-aided Testing. (3)

Prerequisite: consent of instructor.

Introduction to computer-aided testing for product quality assurance using microcomputers, IEEE bus instrumentation, and host minicomputer systems.

541. Advanced Materials Science. (3)

Prerequisite: MET 335 or MFE 250; CivE. 203.

Builds on student's manufacturing and materials background to investigate interrelationship of material and process.

547. Information Transmission. (3)

Prerequisite: EET 314 and consent of instructor.

Function and system analysis and applications for sensing, sending, and processing information.

553. (MfET-MeEn.) Mechanical Behavior of Polymers. (3)

Prerequisite: CivE. 203 and MFE 355 or consent of instructor.

Generalized elasticity relationships, viscoelasticity, yielding and fracture, crazing, rubber elasticity, anisotropic behavior, processing effects on properties, optical and other properties.

555. Introduction to Composites. (3)

Prerequisite: Consent of instructor.

Structure, processing, properties, and uses of composite materials including various manufacturing methods and the relationship between properties and fabrication.

572. Design for Manufacturing. (3)

Prerequisite: MFE 434, senior standing.

The team approach to new product development. Establishing design specifications. Estimating effects of design alternatives on processing costs.

574. Tool Engineering. (3)

Prerequisite: MFE 434, senior standing.

Design of production machines and tools with functionality, producibility, maintainability, and cost considerations utilizing concurrent product and process design approach.

580. Manufacturing Simulation. (3)

Prerequisite: MFE 362 and consent of instructor.

Design and optimization of manufacturing systems using simulation. Simulation languages and modeling methodology.

591R. Graduate Seminar. (0.5)

Prerequisite: graduate standing.

Topics in research and thesis writing. Graduate students will present thesis and dissertation subject.

592R. Materials Seminar. (0.5)

Advanced topics in materials science and engineering.

595R. Special Topics. (Arr.)

Prerequisite: consent of instructor plus departmental approval.

655. Polymer Processing. (3)

Prerequisite: MeEn. 312, MFE 355, or consent of instructor.

Study of rheology and transport phenomena involving polymeric fluids, including an analysis of extrusion, calendaring, die forming, mixing, compression and injection molding, molding of reacting polymers, filament winding, and pultrusion.

698R. Master's Project in Computer-integrated Manufacturing. (1-3)

Prerequisite: departmental approval.

699R. Master's Thesis in Computer-integrated Manufacturing. (1-9)

Prerequisite: departmental approval.

Mechanical Engineering

Chair: Joseph C. Free, 242-C CB, 378-2625

Graduate Coordinator: John N. Cannon, 242-E CB, 378-6539

Faculty/Specialties

Professors

Cannon, John N. (1957) Ph.D., Stanford University, 1965.
Fluids, Combustion, Thermodynamics.

Chase, Kenneth W. (1968) Ph.D., University of California, Berkeley, 1972. Computer-aided Design for Manufacturing.

Free, Joseph C. (1961) Ph.D., Massachusetts Institute of Technology, 1967. Dynamic Systems, Modeling, Automatic Controls, Design Methods for Complex Systems.

Heaton, Howard S. (1963) Ph.D., Stanford University, 1963.
Heat Transfer and Fluid Mechanics.

Mortensen, Kay S. (1968) Ph.D., University of Utah, 1967.
Materials, Expert Systems, Design Methods.

Raisor, E. Max (1968) M.S., Brigham Young University, 1975. Interactive Computer Graphics.

Ulrich, Richard D. (1968) Ph.D., Purdue University, 1959.
Fluids, Thermodynamics.

Wilkes, Doran F. (1958) Ed.D., University of Missouri, Columbia, 1966. Basic Engineering Graphics, Descriptive Geometry, Computer-aided Design.

Wille, Milton G. (1958) Ph.D., University of Michigan, Ann Arbor, 1964. Design, Corrosion, Collision Safety, Biomechanics.

Associate Professors

Eastman, Paul F. (1985) Ph.D., University of Utah, 1965.
Ceramics, Polymer and Composite Materials, Aerodynamics.

Germane, Geoffrey J. (1979) Ph.D., Brigham Young University, 1978. Combustion System Design, Internal Combustion Engines, Automotive Engineering, Thermodynamics.

Parkinson, Alan R. (1982) Ph.D., University of Illinois, 1982. Optimization.

Red, W. Edward (1983) Ph.D., Arizona State University, 1972. Robotics, Automation, Applied Mechanics.

Simmons, Val E. (1969) Ph.D., Utah State University, 1970.
Mechanism and Machine Design.

Smith, Craig C. (1980) Ph.D., Massachusetts Institute of Technology, 1978. Dynamic Systems and Controls, Automation, Auto Safety.

Tolman, Wilford J. (1960) M.S., Brigham Young University, 1964. Computer-assisted Part Programming, Computer Graphics.

Assistant Professors

Cox, Jordan (1986) M.S., Brigham Young University, 1984.
Computer-aided Engineering.

Jensen, C. Gregory (1983) M.S., Brigham Young University, 1982. Computer Graphics Software, Database Development.

Magleby, Spencer P. (1989) Ph.D., University of Wisconsin, Madison, 1988. Computer-aided Design and Manufacture, Intelligent Design Systems.

Queiroz, Mardson (1987) Ph.D., Carnegie-Mellon University, 1987. Combustion.

Sorensen, Carl D. (1987) Ph.D., Massachusetts Institute of Technology, 1985. Design for Manufacture, Manufacturing Processes.

Webb, Brent (1986) Ph.D., Purdue University, 1986. Heat Transfer.

Graduate Programs and Degrees

Mechanical Engineering (M.S.)

Engineering (Ph.D.)

Areas of Emphasis

Design, materials, systems and manufacturing, thermal sciences.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Integrated Master's Program

See page 93 of this catalogue for a description of the integrated master's program in engineering. Special requirements for this program are basically the same as those for the M.S. degree in mechanical engineering but include the following:

I. Application requirements:

A. Formal application for admission submitted to the Office of Graduate Studies at beginning of junior year (before taking final 30 hours of course work).

B. Cumulative GPA of 3.0 for previous 60 hours of course work.

II. Degree requirements:

A. Cumulative GPA of 3.0 or above in all courses to be counted toward master's degree.

B. Study list for both B.S. and M.S. programs to be filed at beginning of junior year.

Program and Degree Requirements

Mechanical Engineering (M.S.)

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examinations:

1. International applicants must submit general GRE and engineering subject test as well as TOEFL scores.

2. U.S. applicants must prove to the department that they have passed the state fundamentals of engineering (FE, formerly EIT) examination, which the state of Utah offers each April and October.

II. Prerequisite:

A. B.S. degree in mechanical engineering or an allied discipline with approval.

B. GPA of 3.0 or above in last 60 hours for regular admission.

Requirements for Degree

- I. Credit hours (34–40):
 - A. Thesis option (34): Minimum 34 hours including 9 thesis hours (MeEn. 699R), MeEn. 591R, and 6 hours of advanced mathematics or equivalent.
 - B. Nonthesis option (40): Minimum 40 course work hours including MeEn. 591R and 6 hours of advanced mathematics or equivalent. A maximum of 3 hours of project work, such as 695R, may be included in the 40-hour total.
- II. Submit study list of approved courses during first semester.
- III. Prospectus: Each student on thesis option must submit prospectus before beginning significant work on thesis.
- IV. Residence: See preceding Engineering section.
- V. Examinations:
 - A. FE examination or GRE (if not taken at time of admission).
 - B. Oral defense of thesis for thesis option candidates.
- VI. Usual time requirement: One calendar year.

Master of Engineering Management (M.E.M.)

See page 93 of this catalogue for a description of the interdisciplinary program in engineering management. M.E.M. students who wish to take classes in the Mechanical Engineering Department should consult the department graduate coordinator to be assigned an advisor.

Engineering (Ph.D.)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Entrance examinations: FE (score of 70 percent) or general GRE (score of 1750), advanced engineering subject test (score of 640), TOEFL (score of 575 minimum).
- III. Prerequisite: B.S. degree (or equivalent) in mechanical engineering from a program accredited by the Accreditation Board for Engineering and Technology (ABET) with a minimum GPA of 3.0 in the last 60 hours of technical and scientific course work. A B.S. in any other field requires provisional admission. Consult the department for specific details.
- IV. Entry times: U.S. applicants, all terms and semesters; international applicants, fall semester preferred.

Requirements for Degree

- I. Credit hours: Minimum of 68 semester hours, at least 50 of which must be course work beyond the baccalaureate degree, plus 18 hours of dissertation (MeEn. 799R).
 - A. Candidates without a master's degree: Of the 50 hours, a minimum of 38 hours must be graduate-level courses. At least 12 hours of the 50 must be advanced mathematics, statistics, or science (a portion of which may be upper-division undergraduate level with specific department approval), and a minimum of 18 hours of dissertation (MeEn. 799R).

- B. Candidates with a master's degree: With advisory approval, up to 20 hours of previous graduate work, including 4 hours of thesis, may apply toward the doctorate. In addition, other courses taken in the master's program may apply toward the required 12 hours of advanced mathematics, statistics, or science.

II. Foreign language and skill requirement:

- A. Students wishing to use language or a combination of language and skill subjects to meet this requirement should confer with the department.
- B. Students taking the skill option must complete at least 18 hours of integrated study in mathematics beyond college trigonometry (Math. 111 at BYU), statistics, or computer science. The 12 hours of advanced mathematics, statistics, or science required in item IA is in addition to this skill requirement.
- III. Study list: The graduate study list must be submitted during the first semester of doctoral study.
- IV. Residence: See preceding Engineering section of this catalogue.
- V. Comprehensive Qualifying Examination: Written and oral examination given in January and June each year. The examination must be taken in the first year of the Ph.D. program (usually after an M.S. degree) and can be retaken only once at the next offering. Students must apply in writing, one month in advance, to take the examination.
- VI. Prospectus: Students must submit and successfully defend a written prospectus on their proposed dissertation research topic at least one year before completion of the degree.
- VII. Dissertation.
- VIII. Oral defense of dissertation.

Mechanical Engineering Graduate Courses

500. (MeEn.—CivE.) Design and Materials Applications. (3)

Prerequisite: CivE. 203; MeEn. 372 or CivE. 321.

Applied and residual stress; materials selection; static, impact and fatigue strength; fatigue damage; surface treatments; elastic deflection and stability—all as applied to mechanical design.

501. (MeEn.—CivE.) Stress Analysis and Design of Mechanical Structures. (3) On dem.

Prerequisite: CivE. 321 or MeEn. 372.

Stress analysis and deflection of structures; general bending and torsion with computer applications to mechanical and aerospace structure design.

502. (MeEn.—CivE.) Plasticity and Fracture Mechanics. (3) On dem.

Prerequisite: MeEn.—CivE. 503.

Continuum theory of plasticity, linear elastic fracture mechanics, introduction to structured continuum theories for polycrystalline media.

503. (MeEn.—CivE.) Theory of Elasticity. (3)

Prerequisite: CivE. 203, Math. 321.

Tensor notation, stress and deformation tensors, constitutive equations, field equations; plane-stress/plane-

strain, plate, axisymmetric, thermoelasticity, and large deformation problems.

504. (MeEn.—CivE.) Matrix Structural Analysis. (3)
Prerequisite: CivE. 321 or MeEn. 372.

Matrix notation, principle of virtual forces, flexibility method, principle of virtual displacements, stiffness method, and general purpose computer programs for structural analysis.

506. (MeEn.—CivE.) Introduction to Finite Element Methods. (3)
Prerequisite: CivE. 321 or MeEn. 372.

Finite element stress analysis; mathematical foundations; simplex, isoparametric, bending, and axisymmetric elements; basic 2-D and 3-D modeling techniques; use of FEA computer software and hardware.

507. (MeEn.—CivE.) Advanced Finite Element Analysis. (3)
Prerequisite: CivE.—MeEn. 506

Complex 3-D finite element modeling, multiple element types, and mesh generation techniques. Application to thermal stress, nonlinear materials, and large deformations. Use of CAE software.

508. (MeEn.—CivE.) Dynamics of Structures and Mechanical Systems. (3)
Prerequisite: Math. 321; CivE. 321 or MeEn. 372.

Dynamic analysis of single and multi-degree-of-freedom systems. Ritz approximation, frequency domain analysis, geometric nonlinearity, and material nonlinearity.

509. (MeEn.—CivE.) Spectral Analysis of Dynamic Systems. (3)
Prerequisite: Math. 321, CivE. 204.

Vibrations of elastic bodies and of systems with multiple degrees of freedom; random vibration. Computer-aided vibration testing and analysis.

510. Compressible Fluid Flow. (3)
Prerequisite: MeEn. 312.

One-dimensional analysis of compressible flow with area change, friction, heat transfer, shock waves, and combined effects, including experimental methods.

511. Intermediate Compressible Flow. (3)
Prerequisite: MeEn. 510.

Subsonic, transonic, and supersonic multidimensional flow. Basic equations; small perturbation theory; method of characteristics for steady and unsteady flow.

512. Boundary Layer Theory. (3)
Prerequisite: MeEn. 312 or consent of instructor.

The stress tensor; Navier-Stokes equations; exact solutions for classical flows; Prandtl's boundary layer equations; separation; Karman-Pohlhausen integral methods; approximate solutions, numerical solutions, and applications.

515. Applied Aerodynamics and Flight Mechanics. (3)
Prerequisite: MeEn. 312.

Modern applied aerodynamics including performance, stability, and control of aerospace vehicles.

521. Energy Resources and Conversion. (3)
Prerequisite: MeEn. 322 or consent of instructor.

New and conventional energy resources and energy conversion systems using principles of thermodynamics.

531. Design of Control Systems. (3)
Prerequisite: MeEn. 435.

Classical frequency response and time domain design of control systems. State variable control and computer simulation of control systems.

534. Dynamic System Analysis and Design. (3)
Prerequisite: MeEn. 435.

Lumped models of mechanical, electrical-mechanical, fluid, and thermal systems; graphic models; physical system response; computer simulation; design of dynamic systems.

537. Advanced Mechanisms. (3)
Prerequisite: MeEn. 337.

Kinematics and dynamics of advanced mechanisms such as robots with computer simulation of mechanism motion.

541. Numerical Heat Transfer. (3)
Prerequisite: MeEn. 440; Math. 311 or consent of instructor.
Heat transfer analysis by numerical methods. Finite difference and finite element methods, stability and error analysis, using digital computers.

542. Design of Heat Transfer Systems. (3) On dem.
Prerequisite: MeEn. 440.

Design of devices where heat transfer is a predominate effect; practical problems from industry; energy-conservation economics.

553. (MeEn.—MfET.) Mechanical Behavior of Polymers. (3)
Prerequisite: CivE. 203, MFE 355, or consent of instructor.

Generalized elasticity relations, viscoelasticity, yielding and fracture, crazing, rubber elasticity, anisotropic behavior, processing effects on optical and other properties.

554. Advanced Manufacturing Processes. (3)
Prerequisite: MeEn. 250 or consent of instructor.

Analysis of forming, machining, welding, and casting processes, emphasizing metal microstructures. Selection of process parameters, considering economics and material properties.

556. Composite Material Design. (3)
Prerequisite: MeEn. 250.

Macro- and micromechanical analysis and design of uni- and multidirectional composite materials.

557. Corrosion. (3)
Prerequisite: Chem. 105.

Basic principles, eight common forms of corrosion, testing, materials, applications, modern theory, and high-temperature metal-gas reactions.

570. (MeEn.—CivE.) Computer-aided Engineering Software Design. (3)

Prerequisite: FORTRAN or similar computer language.

Programming techniques and structure for interactive engineering design software. Use of engineering library utility routines for user interface, graphics, and data access. Term project required.

571. (MeEn.—CivE.) Engineering Computer Graphics and Software Design. (3)

Prerequisite: FORTRAN or similar computer language.

Application of modern computer graphics techniques to engineering problems, 2-D and 3-D transformations, perspective, hidden surface removal, lighting and shading, Graphics data structures, standards, and device independency. Software design methodology. Term project required.

572. (MeEn.—CivE.) Computer-aided Geometric Design. (3)

Prerequisite: FORTRAN or similar computer language.

Mathematical theory of free-form curves and surfaces and solid geometric modeling, Bezier and B-spline curve and surface theory, parametric and implicit forms, intersection algorithms, topics in computer algebra, free-form deformation. Several programming projects required.

573. CAD Software Development. (3) On dem.

Prerequisite: advanced FORTRAN or C.

Theory and development of CAD 2-D and 3-D systems including programming of curves, surfaces, solids, data fitting, and CAD interfaces.

574. Geometric Modeling with CAD Systems. (3) On dem.

Prerequisite: Math. 321, MeEn. 371.

Canonical and parametric modeling of basic geometric entities as they apply to mechanical design, including topology, single domain theory, and fractals.

575. (MeEn.—CivE.) Optimization Techniques in Engineering. (3)

Prerequisite: Math. 321 and FORTRAN or similar computer language background.

Application of nonlinear computer optimization techniques to constrained engineering design. Theory and use of state-of-the-art computer routines.

576. Advanced Methods for Engineering Design. (3) On dem.

Prerequisite: MeEn. 475.

Emerging design methodology and design strategies for complex systems including decomposition methods, sensitivity analysis, robust design, and expert systems in engineering design.

581. Internal Combustion Engines. (3)

Prerequisite: MeEn. 322.

Computer modeling of performance and fuel economy, including exhaust emissions of spark-ignition and compression-ignition engines. Theoretical and actual cycles. CFR and production engine dynamometer testing.

584. Rocket, Jet Engine, and Fluid Machinery Design. (3)

Prerequisite: MeEn. 312, 322.

Design and synthesis of radial and axial-flow machines, pumps, and rocket, ramjet, and turbojet engines utilizing fluid flow and thermodynamic fundamentals.

591R. Seminar. (1)

Graduate seminar to develop oral and written skills for presentation of current topics in mechanical engineering.

595R. Special Topics in Mechanical Engineering. (Arr.)

Prerequisite: consent of department chair.

611. Theories of Fluid Turbulence. (3) On dem.

Prerequisite: MeEn. 312, Math. 321.

Theoretical and experimental study, including statistical and phenomenological models. Analyzing classical flow equations using Reynolds convention.

612. Principles of Ideal-Fluid Dynamics. (3) On dem.

Prerequisite: MeEn. 312, Math. 321.

Ideal-fluid hydrodynamics and aerodynamics, including ideal-fluid assumptions, rotational and irrotational flow, acyclic and cyclic motion, circulation, and lift.

631. Advanced Automatic Control Applications. (3)

Prerequisite: MeEn. 531.

Mechanical control system analysis by computer methods; nonlinear methods; applications of modern control theory and computer controllers.

637. Dynamics in Mechanical System Design. (3) On dem.

Prerequisite: MeEn. 531 or 534.

Applied design analysis of complex systems needing evaluation of vibrations, transient response, and/or feedback control. Classical, modern, and computer techniques.

641R. Special Topics in Heat-Transfer Theory. (3) On dem.

Prerequisite: MeEn. 440.

Analysis of heat transfer in conduction, convection, or radiation.

642. Radiative Heat Transfer. (3)

Prerequisite: MeEn. 440 or equivalent.

Engineering analysis of radiant heat exchange between surfaces, in enclosures, and in absorbing, emitting, and scattering media.

643. Convective Heat Transfer. (3)

Prerequisite: MeEn. 440 or equivalent.

Engineering analysis of convective heat transfer in internal and external laminar and turbulent flows.

651. Advanced Topics in Manufacturing. (3) On dem.

Prerequisite: MeEn. 554 or consent of instructor.

Presentation and evaluation of advanced aspects of material behavior, forming, welding, casting, and machining.

655. Polymer Processing. (3)

Prerequisite: MeEn. 312 and MFE 355 or consent of instructor.

Rheology and transport phenomena involving polymeric fluids. Analysis of extrusion, calendaring, die forming, mixing, compression and injection molding, filament winding, and pultrusion.

692R. Materials Seminar. (0.5) On dem.

Prerequisite: graduate standing in engineering or scientific field.

Advanced topics in materials science and engineering.

695R. Special Problems for Master's Students. (1-3)

Prerequisite: consent of department chair.

697R. Research. (6-9) On dem.

699R. Master's Thesis. (1-9)

791R. Seminar for Doctoral Students. (1)

795R. **Selected Topics in Mechanical Engineering.** (1-3)

799R. **Doctoral Dissertation.** (1-18)

English

Chair: William A. Wilson, 3146 JKHB, 378-3053

Graduate Coordinator: Gloria L. Cronin, 3142 JKHB, 378-3053

Faculty/Specialties

Professors

- Arnold, Marilyn (1969) Ph.D., University of Wisconsin, Madison, 1968. Nineteenth- and Twentieth-Century American Fiction.
- Cracroft, Richard H. (1963) Ph.D., University of Wisconsin, Madison, 1970. Nineteenth-Century American Literature, Literature of the American West, Mormon Literature.
- England, Eugene (1977) Ph.D., Stanford University, 1973. Nineteenth-Century American Literature, Mormon Literature, Creative Writing, Shakespeare.
- Evans, David L. (1954) Ph.D., University of Utah, 1968. Modern American Literature.
- Fox, Charles Jay (1980) Ph.D., Purdue University, 1971. Late Nineteenth- and Early Twentieth-Century British Literature.
- Gassman, Byron W. (1960) Ph.D., University of Chicago, 1960. Restoration and Eighteenth-Century English Literature, English Novel.
- Geary, Edward A. (1968) Ph.D., Stanford University, 1971. Late Nineteenth- and Early Twentieth-Century English Literature, Twentieth-Century Literature, English Novel.
- Harris, John S. (1962) M.A., Brigham Young University, 1958. Technical Writing, American Literature to 1950.
- Lambert, Neal E. (1966) Ph.D., University of Utah, 1966. American Literature 1620-1860, Literature of the American West.
- Murphy, John J. (1984) M.A., St. John's University, 1961. Nineteenth- and Early Twentieth-Century American Literature.
- Norris, G. Leslie (1983) M.Phil., Southampton University (England), 1958. Creative Writing, English Romantic Literature, Contemporary Poetry, Twentieth-Century English Poetry and Prose.
- Poulsen, Richard C. (1975) Ph.D., University of Utah, 1975. Folklore and Mythology, Critical Theory, American Studies.
- Skousen, Royal (1979) Ph.D., University of Illinois, 1972. Linguistics (Phonology, Morphology, Analogical Modeling, Mathematical Linguistics, Historical Linguistics), English Linguistics (Structure of English, English Spelling), Textual Criticism.
- Tanner, Stephen L. (1978) Ph.D., University of Wisconsin, Madison, 1969. American Literature, Literary Criticism.
- Thayer, Douglas H., Associate Dean (1957) M.F.A., University of Iowa, 1962. Creative Writing.
- Thomas, Gordon K. (1976) Ph.D., Tulane University, 1968. English Romantic Literature, Shakespeare.
- Thomas, John Alfred (1962) Ph.D., University of Maryland, College Park, 1962. English Renaissance Literature, Seventeenth-Century English Literature, Shakespeare.

- Walker, Steven C. (1966) Ph.D., Harvard University, 1973. Victorian Literature, Bible as Literature.
- Wilson, William A. (1984) Ph.D., Indiana University, 1974. Folklore and Mythology, American Studies, Journal Editing.

Associate Professors

- Best, Brian S. (1960) Ph.D., University of Wisconsin, Madison, 1971. Shaw.
- Clark, Gregory D. (1985) Ph.D., Rensselaer Polytechnic Institute, 1985. Rhetorical Theory and Criticism, Early American Literature, Composition Theory and Pedagogy.
- Cronin, Gloria L. (1984) Ph.D., Brigham Young University, 1980. Twentieth-Century American Literature, Jewish American Literature, Nineteenth- and Twentieth-Century Anglo-American Women's Literature.
- Hunsaker, O. Glade (1964) Ph.D., University of Illinois, 1970. Milton.
- Johnstoneaux, Raphael (1986) Ph.D., George Peabody College for Teachers of Vanderbilt University, 1980. Modern American Literature, English Education, Composition Theory and Pedagogy.
- Jorgensen, Bruce W. (1975) Ph.D., Cornell University, 1978. Creative Writing (especially Fiction), Nineteenth-Century American Literature (especially the "American Renaissance"), Contemporary American Fiction.
- Paxman, David B. (1988) Ph.D., University of Chicago, 1982. Eighteenth-Century English Literature, Shakespeare.
- Pedersen, Elray L. (1983) Ph.D., University of Minnesota, 1977. English Education, Teaching of Writing, Linguistics.
- Tanner, John S. (1982) Ph.D., University of California, Berkeley, 1980. Sixteenth- and Seventeenth-Century English Literature, Religious Approaches to Literature.
- Taylor, Sally T. (1978) Ph.D., University of Utah, 1975. Creative Writing, Composition, Drama.
- Young, Bruce W. (1983) Ph.D., Harvard University, 1983. English Renaissance Literature, Shakespeare, Literary Theory and Criticism.

Assistant Professors

- Bennion, John S. (1989) Ph.D., University of Houston, 1989. Creative Writing, Victorian Literature, English Novel.
- Boswell, Grant M. (1984) Ph.D., University of Southern California, 1985. Rhetorical Theory, Composition Theory and Pedagogy.
- Cowles, David L. (1985) Ph.D., University of Chicago, 1985. Victorian Literature, English Novel, Poststructuralist Theory.
- Duerden, Richard Y. (1989) Ph.D., University of Chicago (1989). English Renaissance Literature, Literary Theory and Criticism.
- Eggington, William G. (1989) Ph.D., University of Southern California, 1984. Varieties of English, Contrastive Rhetoric, Language Planning and Policy, Literacy, Cross-cultural Communication.
- Farr, Cecilia Konchar (1990) Ph.D., Michigan State University, 1990. Modern American and British Literature, Literary Theory and Criticism, Nineteenth-Century American Literature.

- Hansen, Kristine (1987) Ph.D., University of Texas, Austin, 1987. Rhetoric, Composition Theory, Composition Pedagogy.
- Harris, Claudia W. (1990) Ph.D., Emory University, 1990. Modern Drama, Contemporary British Literature, Irish Studies.
- Houston, Gail T. (1990) Ph.D., University of California, Los Angeles, 1990. Victorian Literature, English Novel.
- Howe, Susan (1989) Ph.D., University of Denver, 1989. Creative Writing, Modern and Contemporary Drama.
- Lundquist, Suzanne E. (1984) D.A., University of Michigan, 1985. Native American Sacred Texts and Modern Novels, Third World Literature, Development of Literacy.
- Madsen, Michael W. (1990) Ph.D., Emory University, 1990. Dialectology, General Linguistics, Usage, Grammar.
- Oaks, Dallin D. (1990) Ph.D., Purdue University, 1990. English Linguistics, Old English Language and Literature.
- Parry, Catherine Corman (1985) Ph.D., University of California, Los Angeles, 1985. Chaucer, Medieval English Literature, Old English, Middle English.
- Snyder, Phillip A. (1988) Ph.D., University of North Carolina at Chapel Hill, 1988. Modern British and American Literature, Contemporary Literature.
- Sorensen, Peter J. (1990) Ph.D., Washington State University, 1988. English Romantic Literature.
- Spencer, Darrell K. (1985) Ph.D., University of Utah, 1985. Creative Writing, American Novel.
- Thomas, Paul R. (1980) D. Phil., University of York (England), 1982. Chaucer, Middle English Language and Literature, English Renaissance Literature.

Graduate Program and Degree English (M.A.)

Areas of Emphasis

American Literature, Creative Writing, English Literature (beginning to 1800), English Literature (1800 to present), Language, Other Literature (folklore, ethnic, etc.), Rhetoric.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

English (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: March 15.
 - B. Entrance examination: GRE advanced literature subject test.
 - C. Application, including writing sample.
- II. Prerequisite:
 - A. Undergraduate major or its equivalent.
 - B. One course in literary criticism (Engl. 351 or 352 or equivalent) and one course in the history of the English language (Engl. 324 or equivalent).
 - C. Reading knowledge of one foreign language, preferably French or German.
- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (31): Minimum 25 course work hours plus 6 thesis hours (Engl. 699R).
- II. Core requirement:
 - A. Engl. 600 (Introduction to Graduate Studies, 1 hr.)
 - B. Engl. 610, or a rhetoric section of Engl. 521R with approval (3 hrs.)
 - C. Engl. 620 or, with approval, Engl. 527, 528, 529, 624, or 626 (3 hrs.)
 - D. Theory-intensive literature course or Engl. 650R (3 hrs.). Theory-intensive literature courses are sections of existing graduate literature courses (631, 635, 641, 655, 658R, 661, 662, 664, 665, 666, 667, 671, 672, 673, 674, 675, 676, 680, or 682) that have been approved to be taught as theory intensive in a given semester. These sections make explicit a particular theoretical approach and apply that approach to the literature of that course. They are proposed by faculty members for a given semester, approved by appropriate departmental process, and designated as such in the Class Schedule.

Note: Students with an approved emphasis in creative writing are not required to take a theory-intensive course. They may elect another course from the graduate coordinator's approved list.
- III. Emphasis: 9 hours of course work in an approved area of emphasis beyond the core that will support 6 hours' work on thesis. The emphasis must constitute a coherent body of study in an area the faculty can support (see preceding Areas of Emphasis section). Courses within an emphasis are proposed by the student and approved through appropriate departmental process.
- IV. Electives: 6 hours of approved study outside the core and area of emphasis.
- V. Limitation on individual readings courses: No more than 3 hours of individual readings (Engl. 590R) may be applied to the minimum 25 hours of course work.
- VI. Thesis: (6 hrs. of 699R). Thesis on a topic demanding research and analysis; or, for those with creative writing as their approved emphasis, a substantial creative work.
- VII. Examination: Examination on thesis, related course work in emphasis, and an approved reading list related to emphasis.

English Graduate Courses

500R. Eminent American Writers. (1-3)

Different writers each semester.

510R. Eminent English Writers. (1-3)

Different writers each semester.

515R. Advanced Scholarly Writing. (3)

Workshop for potential graduate students, graduate students, and professionals in all disciplines in preparing the thesis, dissertation, book chapter, and article.

516. Advanced Technical Writing. (3)

Prerequisite: Engl. 316 or consent of instructor.

Advanced technical writing concepts, including literature of technical writing, liaison with technical staff, communication networks, rhetoric of graphics, and teaching and freelancing technical writing.

518R. Advanced Creative Writing. (3)

Prerequisite: Engl. 318R, 319R, or consent of instructor.

Writing fiction, poetry, drama, and the essay; individual consideration of manuscripts; professional orientation. May be repeated for credit with departmental approval.

520R. Studies in Theme and Form. (1-3)

Topics vary: literature and film, myth and archetype, science fiction, etc.

521R. Studies in Language and Rhetoric. (1-3)

Prerequisite: Engl. 324.

Specific studies in language or rhetoric. Topic varies with instructor.

527. Early Modern English. (3)

Prerequisite: Engl. 323, 324.

English language from about 1500 to 1800, with special emphasis on language of Shakespeare and the King James Bible.

528. Varieties of English. (3)

Prerequisite: Engl. 223, 324.

Regional and social variation in English, especially standard and non-standard national and world Englishes, including English-based pidgins and creoles.

529. Structure of Modern English. (3)

Prerequisite: Engl. 328, Ling. 325, or consent of instructor.

English syntax through modern grammars; theories underlying those grammars.

590R. Individual Readings in English. (1-3)

Prerequisite: approval of graduate coordinator.

Language and/or literature beyond what is offered in the curriculum. May not be substituted for another catalogue course.

599R. Cooperative Education. (1-9)

Prerequisite: consent of graduate coordinator.

On-the-job training.

600. Introduction to Graduate Studies. (1)

Trends in postgraduate curricula, ideology, pedagogy, and professional publication in language and literature.

610. Rhetoric and Composition. (3)

Theory and methods of teaching rhetoric and composition; emphasis on rhetoric's relationship to the study of literature and language. (Required of all graduate student instructors.)

612. History of Rhetoric. (3)

Major texts, thinkers, and movements of the Western rhetorical tradition from classical antiquity to the present.

614. Theory of Rhetoric and Composition. (3)

Prerequisite: Engl. 610

Rhetorical theory and its relationship to current issues in rhetoric and composition.

616. Research in Rhetoric and Composition. (3)

Prerequisite: Engl. 610

Research methods in rhetoric and composition; evaluation of assumptions, strengths, and limitations of each method; identification of student research topics.

620. Language and Literature. (3)

Literature from a language perspective; applying linguistic constructs to literary language; examining literary style; linguistic analysis of unfamiliar texts.

624. Old English. (3)

Old English grammar and vocabulary; traditional syntactical patterns in various types of Old English prose and poetry.

625. Beowulf. (3)

Prerequisite: Engl. 624.

Close reading of the poem in the original, emphasizing literary and cultural values.

626. Middle English. (3)

Detailed study of the principal dialects as illustrated in the literature of the period.

631. Studies in the English Novel. (3)

Analysis of literary values and techniques in selected novels.

635. Studies in the American Novel. (3)

Various approaches to the novel, emphasizing the formal.

641. Studies in Drama. (3)

Intensive study of drama.

650R. Studies in Literary Criticism. (3)

Prerequisite: Engl. 351. Recommended: Engl. 352.

Modern critical theory and practice applied to specific literary works.

655. Women's Textual Studies. (3)

Ways feminist critical insights affect the study of language, literature, and culture.

658R. Ethnic, Regional, and Other Literatures in English. (3)

Emphasis varies with instructor.

661. Studies in Early American Literature. (3)

Texts from times of the English settlement through the early 1800s.

662. Studies in Early Nineteenth-Century American Literature. (3)

Texts from the early 1800s through midcentury, with special attention to romanticism in America.

664. Studies in Late Nineteenth-Century American Literature. (3)

Texts from the middle through the end of the nineteenth century, with special attention to realism in America.

665. Studies in Early Twentieth-Century American Literature. (3)

Texts, trends, and writers from 1900 to midcentury.

666. Studies in Late Twentieth-Century American Literature. (3)

Texts, trends, and writers from the end of World War II to the present.

667. Studies in Folklore. (3)

Prerequisite: Engl. 391 or consent of instructor.

Directed study in folklore and folkways, including Mormon heritage and tradition. Collecting, analyzing, and editing.

669R. Teaching English in the Secondary Schools. (2)

Prerequisite: Engl. 377 or consent of instructor.

Literature, writing, language, and reading materials appropriate to English courses; effective use of these materials.

671. Studies in English Medieval Literature. (3)

Close reading in the original of a principal work, such as *Troilus and Cryseyde*, *Piers Plowman*, or *Sir Gawain and the Green Knight*, emphasizing its relation to other literature, culture, and history of the period.

672. Studies in English Renaissance Literature. (3)

Individual authors, styles, influences, and trends in sixteenth- and seventeenth-century English literature.

673. Studies in English Classicism. (3)

Selected writers from 1660 to 1780.

674. Studies in English Romanticism. (3)

Selected writers and trends from 1780 to 1832.

675. Studies in Victorian Literature. (3)

Literary genres, values, and techniques in representative works from 1832 to 1890.

676. Studies in Modern British Literature. (3)

Selected authors and works from 1890 to 1950.

680. Studies in Contemporary Literature. (3)

Specific trends in literature and criticism since mid-century.

682. Studies in Shakespearean Scholarship and Criticism. (3)

Prerequisite: Engl. 382 or consent of instructor.

699R. Master's Thesis. (Arr.)

See options described under master's program in English.

Family Sciences

Chair: Terrance D. Olson, 1000 SWKT, 378-2060

Graduate Coordinator: Wesley Burr, 1040 SWKT, 378-6415

Faculty/Specialties

Professors

Allred, G. Hugh (1966) Ed.D., University of Oregon, 1966.
Adult Survivors of Childhood Abuse and Their Families.

Brasher, Ruth E. (1969) Ph.D., Utah State University, 1969.
Family and Social Systems, Theoretical Foundations of Home Economics, Adult Education.

Burr, Wesley R. (1969) Ph.D., University of Minnesota, Minneapolis, 1967. Developing and Applying Theories in Family Sciences.

Cahoon, Owen W. (1970) D.Ed., Pennsylvania State University, 1970. Child Development and Early Childhood Education.

Edwards, Kay P. (1974) Ph.D., Cornell University, 1969.
Consumer Economics and Family Law.

Galbraith, Richard C. (1975) Ph.D., Northwestern University, 1975. Children's Intelligence and Memory.

Hoopes, Margaret H. (1970) Ph.D., University of Minnesota, Minneapolis, 1969. Couple Interaction Research, Birth Order of First Four Positions in the Family, Multigenerational Families.

Larsen, Jean M. (1963) Ph.D., University of Utah, 1972.
Effects of Preschool, Teacher Training, Care and Education of Young Children, Parent/Provider Training.

Mead, D. Eugene (1967) Ed.D., University of Oregon, 1967.
Marriage and Family Therapy.

Moss, J. Joel (1961) Ph.D., University of North Carolina, Chapel Hill, 1954. Family Life Education, Family in the Later Years.

Olson, Terrance D. (1974) Ph.D., Florida State University, 1972. Philosophy of Family Sciences, Quality Family Relationships.

Peery, J. Craig (1980) Ph.D., Columbia University, 1973.
Human Development, Personality and Social Development.

Stahmann, Robert F. (1975) Ph.D., University of Utah, 1967.
Premarital Counseling; Marital, Sexual, and Family Therapy.

Taylor, Barbara J. (1957) Ph.D., Brigham Young University, 1971. Curriculum Development, Administration and Teacher Training for Early Childhood Education.

Vance, Barbara Jane (1967) Ph.D., Stanford University, 1967. Family Life Education.

Associate Professors

Beutler, Ivan F. (1981) Ph.D., Purdue University, 1974.
Family Resource Management.

Crane, D. Russell (1983) Ph.D., Brigham Young University, 1979. Marital Therapy and Divorce.

Draper, Thomas W. (1982) Ph.D., Emory University, 1976.
Children and Technology, Men, Children.

Feinauer, Leslie L. (1984) Ph.D., Brigham Young University, 1981. Family Violence, Aging Families.

Harper, James M. (1979) Ph.D., University of Minnesota, Minneapolis, 1979. Marital and Family Therapy, Family Relationships.

Holman, Thomas B. (1985) Ph.D., Brigham Young University, 1981. Premarital and Marital Factors Relating to Later Marital Quality and Stability.

Larson, Jeffrey H. (1987) Ph.D., Texas Tech University, 1980.
Family Interaction, Premarital Counseling.

Lind, Charlene (1964) Ph.D., University of Wisconsin, 1974. Social/Psychological Aspects of Clothing.

McKee, Trevor R. (1974) Ph.D., Brigham Young University, 1973. Language Acquisition and Duolingual Parenting.

Poduska, Bernard E. (1983) Ph.D., Brigham Young University, 1983. Family Resource Management, Family Interaction.

Robinson, Clyde C. (1990) Ph.D., University of North Carolina at Greensboro, 1982. Child Development, Family Relations.

Assistant Professors

Bahr, Kathleen S. (1970) Ph.D., Michigan State University, 1982. Family Ecology, Home Management and Family Relationships.

Ellsworth, Carol (1969) Ed.D., Brigham Young University, 1980. Curriculum and Instruction.

- Garrison, Carolyn (1970) Ph.D., Purdue University, 1978.
Household Equipment and Housing, Adult Education.
- Hawkins, Alan J. (1990) Ph.D., Pennsylvania State University, 1990. Human Development and Family Studies.
- Klein, Shirley R. (1986) Ph.D., University of Utah, 1990. Cultural Foundations of Education, Curriculum, Instruction, Home and Family Issues in Secondary Classrooms.
- Rowley, Maxine R. (1980) Ph.D., Brigham Young University, 1989. Education Administration in Higher Education.
- Thackeray, Renee (1973) M.S., Oregon State University, 1960. Textiles, Social/Psychological Aspects of Clothing.

Graduate Programs and Degrees

Family Sciences (M.S.)

Marriage and Family Therapy (M.S.)

Family Sciences (Ph.D.)

Family Studies (Ph.D.)

Marriage and Family Therapy (Ph.D.)

Areas of Emphasis

Family life education, family resource management, human development, clinical practice, teaching/supervision, research.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Family Sciences (M.S.)

The M.S. degree in family sciences provides the student with a comprehensive, broad-based understanding in human development and/or family science. Four subject areas are available to the student according to his or her professional goals: family life education, family resource management, human development, and home economics education. The home economics education program accommodates part-time as well as full-time students. Home economics courses are taught late afternoons or evenings during the school year to enable teachers in the local area to enroll.

Admission and Entry (same for all specialties)

- I. Application requirements:
 - A. Deadline: February 1.
 - B. At least three letters of recommendation are required, at least two from academic faculty or others qualified to assess academic qualifications.
 - C. Graduate Record Examination required.
- II. Prerequisite:
 - A. Family sciences: FamSc. 310, 460, and other courses as required by graduate committee.
 - B. Home economics: Stat. 552 or equivalent and other courses as required by graduate committee.
 - C. Human development: FamSc. 310; 420 or 422; Psych. 301, 302, 341.
- III. Entry time: Fall semester.

Requirements for Degree

- I. Credit hours:
 - A. Family sciences: (36): Minimum 30 course work hours plus 6 thesis hours (FamSc. 699R).
 - B. Home economics education: (30): Minimum 24 course work hours plus 6 thesis hours (FamSc. 699R).
- II. Required courses:
 - A. Family life education: FamSc. 514, 560, 565, 600, 699R (6 hours minimum).
 - B. Family resource management: FamSc. 460, 540, 545, 560, 570, 600, 699R (6 hours minimum); Stat. 554 or Soc. 500.
 - C. Home economics education:
 1. For instructional or curricular emphasis: FamSc. 565, 600, 676, 689, Stat. 554.
 2. For international emphasis: FamSc. 565, 600, 662, 678, 689, Stat. 554.
 - D. Human development: FamSc. 510, 511, 512, 513, 514, 600, 602, 660, 699R (6 hours minimum); Stat. 501; PE—S 550.
- III. Electives:
 - A. Family life education: 15–20 hours determined in consultation with advisory committee.
 - B. Family resource management: 6–9 hours from FamSc. 501R, 595R, 601, 675, 689; Econ. 315, or courses approved by advisory committee.
 - C. Home economics education: As determined in consultation with advisory committee. FamSc. 530 recommended.
 - D. Human development: As determined in consultation with advisory committee.
- IV. Minor: Any minor approved by advisory committee, but none is required.
- V. Thesis.
- VI. Examination: Oral defense of thesis.

Marriage and Family Therapy (M.S.)

The department offers the master of science (M.S.) degree as a two-year program. The objective of this degree is to train persons who will be outstanding clinicians, prepared to function in a wide variety of marriage and family therapy settings. The curriculum is based on state licensure/certification requirements and is accredited by the Commission on Accreditation of the American Association for Marriage and Family Therapy. The master's degree is the basic credential for independent practice in marriage and family therapy.

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 1.
 - B. Entrance examination: General GRE; score subject to review.
- II. Prerequisite: Background in research, e.g., research methodology and statistics (5 hours); behavioral sciences, e.g., personality, child development, abnormal psychology, learning theory (9 hours); social sciences, e.g., family living, social psychology, sociology (6 hours).
- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (63): Minimum 57 course work hours plus 6 thesis hours (699R).
- II. Required courses: FamSc. 555R (6 hours), 563, 564, 600, 640, 645, 650, 651, 652, 653, 654, 655R (10 hours), 656, 699R (6 hours); Stat. 501 or Psych. 501; electives (3 hours).
- III. Clinical requirement: 500 hours of direct client experience.
- IV. Thesis.
- V. Examination: Oral defense of thesis.

Family Sciences (Ph.D.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 1.
 - B. Entrance examination: General GRE; score subject to review.
- II. Prerequisite:
 - A. Regular candidates: Master's degree in family sciences or equivalent.
 - B. Human development specialty candidates: Master's degree in human development or equivalent; direct admission with a B.S. or B.A. degree is possible, but outlined course work would be integrated into doctoral program.
- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (72 plus skill): Minimum 54 course work hours plus 18 dissertation hours, plus skill requirement.
- II. Required courses: Determined in consultation with advisory committee.
- III. Minor: Any minor approved by advisory committee, but none is required.
- IV. Skill requirement: Consult department for details.
- V. Dissertation (18 hours minimum).
- VI. Examinations:
 - A. Written comprehensive examination.
 - B. Oral defense of dissertation.

For detailed information consult the department's Human Development Area coordinator.

Family Studies (Ph.D.)

Details for this program are specified in this catalogue under the heading Family Studies. The Family Studies Program operates as an interdepartmental program involving the Departments of Family Sciences and Sociology.

Marriage and Family Therapy (Ph.D.)

The program is accredited by the Commission on Accreditation for Marriage and Family Therapy Education of the American Association for Marriage and Family Therapy and has three interrelated emphases—clinical practice, teaching/supervision, and research.

There are two options for the Ph.D. degree in marriage and family therapy. The first is for students who already have a master's degree and should take approximately three years to complete. The second is for the post-baccalaureate student and should take approximately four years to complete. The master's curriculum is followed during

the first two years, with the M.S. degree awarded at the completion of those requirements.

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 1.
 - B. Entrance examination: General GRE; score subject to review.
- II. Prerequisite:
 - A. Post-master's option: Master's degree from a regionally accredited college or university. Applicants without a marriage and family therapy master's degree may need to complete prerequisite course work.
 - B. Post-baccalaureate option: Baccalaureate degree from a regionally accredited college or university; background in research, e.g., research methodology and statistics (5 hours); behavioral sciences, e.g., child development, abnormal psychology, learning theory (9 hours); social sciences, e.g., family sciences, psychology, social psychology, sociology (6 hours).
- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (80 plus skill beyond baccalaureate; 48 plus skill beyond master's): Minimum 62 course work hours beyond the baccalaureate or 30 course work hours beyond the master's, plus 18 dissertation hours (FamSc. 799R), plus skill hours.
- II. Required courses: Determined in consultation with advisory committee.
- III. Minor: Any minor approved by advisory committee, but none is required.
- IV. Skill requirement: Consult department.
- V. Clinical requirement: 500 hours of direct client experience.
- VI. Dissertation.
- VII. Examinations:
 - A. Written and oral comprehensive examinations in clinical practice, teaching/supervision, and research.
 - B. Oral defense of dissertation.

Program and Degree Resources

Camilla Eyring Kimball Chair of Home and Family Life
Comprehensive Clinic
Family and Demographic Research Institute
Women's Research Institute

Family Sciences Graduate Courses

501R. Workshop in Family Sciences. (1–2)

Prerequisite: 8 hours in family sciences or consent of department chair.

Intensive study in applying principles of specified family sciences, subject matter in early childhood education, child development, family relationships, family resource management, or marriage/family therapy.

510. Seminar in Intellectual Development. (3)

Prerequisite: FamSc. 514.

Current theories and research on intellectual development.

511. Seminar in Social Development. (3)

Prerequisite: FamSc. 514.

Current theories and research on social development, emphasizing positive social development. Play, music, creativity, and friendship.

512. Seminar in Emotional Development. (3)

Current theories and research on emotional development.

513. Seminar in Moral Development. (3)

Current theories and research on moral development.

514. Seminar in Theories of Human Development. (3)

Prerequisite: FamSc. 310.

Intensive investigation of theoretical frameworks, models, and concepts of dominant contemporary theories in child development.

520. Head Teachers Practicum in Preschool. (4)

Prerequisite: FamSc. 420 or 422 or equivalent classroom experience with young children and consent of instructor.

Head teaching proficiencies: guiding teachers of young children, techniques for involving parents, evaluating student teachers, assessing child performance, review of child guidance, and curriculum development.

521R. Workshop in Home Economics Education. (1-2)

On dem.

Prerequisite: consent of instructor.

522R. Seminar in Early Childhood Education. (2)

Prerequisite: FamSc. 422 and consent of instructor.

Teacher skills: developing, applying, measuring, and evaluating effective techniques. Curriculum: selecting, organizing, and creating curriculum materials for young children.

530. Program Evaluation and Home Economics Education for Adults. (2)

Prerequisite: home economics education background.

Evaluation techniques and construction of evaluation devices. Principles, practices, programs, materials, and resources for teaching adults.

535. Advanced Household Equipment. (3)

Prerequisite: FamSc. 335 and 336 or equivalent or consent of instructor.

Study and experimental problems of fabric care and food-related appliances.

540. Family Economics. (3)

Economic functioning of household; role of income, employment, and household production as determinants of family living level.

545. Family Financial Resource Management. (3)

Prerequisite: FamSc. 340 or equivalent.

Applying theories and principles in managing financial resources to meet needs of individuals and families.

555R. Beginning Practicum in Marriage and Family Therapy. (3)

Prerequisite: FamSc. 650 and consent of instructor.

Introduction to clinical methods and experience in counseling individuals, premarital and marital dyads, and families. For marriage and family therapy majors only.

560. (FamSc.-Soc.) Contemporary Theories about the Family. (3)

Contemporary theories and research about the family, emphasizing role exchange and systems theories.

561. Seminar in Family Law. (3)

Prerequisite: concurrent registration in FamSc. 461.

Intensive investigation of issues and concepts influencing legal aspects of marriage and family life.

562. Seminar in Professional Responsibility. (3)

Ethical issues and legal responsibility in professional practice.

563. Theoretical Foundations of Family Systems. (3)

Systems theory and cybernetic approaches to family processes and epistemological issues.

564. Human and Family Development Over the Life Cycle. (3)

Interrelationships between individuals and family life cycle development, including modifying family processes and structure over time.

565. Instructional Processes in Family Sciences. (3)

Methods and curriculum of design, development, implementation, management, and evaluation related to family sciences and home economics curricula.

566R. Practicum in Family Life Education. (1-2)

Prerequisite: FamSc. 565 or consent of instructor.

Supervised experience teaching family living courses in a university setting.

570. Advanced Home Management. (3)

Prerequisite: FamSc. 371 or equivalent.

Historical development of home management as a field of study. Theory and research, including family decision making, values, standards, and goals.

590R. Readings in Family Sciences. (1-2)

Prerequisite: FamSc. 310 or 460 and consent of instructor.

Discussions and reports of current readings.

595R. Special Topics in Family Sciences. (1-2)

Prerequisite: for family sciences major—FamSc. 310 or 460 and consent of instructor; for Independent Study associate degree major emphasizing family sciences—approval of this course by faculty advisor as final project.

Individual study for qualified students.

600. (FamSc.-Soc.) Advanced Research Methods. (3) Alt. sem., Sp, Su

Prerequisite: Soc. 300 or consent of instructor.

Training in survey, experimental, secondary analysis, content analysis, qualitative, evaluation, and environmental impact research techniques.

601. (FamSc.-Soc.) Seminar in Survey Research. (3)

Prerequisite: Soc. 300 or equivalent.

Survey research techniques of the behavioral sciences, emphasizing research and sampling designs.

602. (FamSc.-Soc.) Experimental Design. (3)

Prerequisite: FamSc.-Soc. 600, Stat. 501 or equivalent, or consent of instructor.

Research methods, logic, writing, and data analysis.

603R. (FamSc.-Soc.) Research Practicum. (3)

Prerequisite: consent of instructor.

Design, data collection, data analysis, and write-up.

622R. Advanced Seminar in Early Childhood Education. (2)

Prerequisite: FamSc. 422, 522, or equivalent.

Supervision in ECE: practical experience in applying supervision principles. Administration of ECE: theories and issues applied to administrative processes and skills.

623. History, Theories, and Current Issues in Early Childhood Education. (3)

Prerequisite: consent of instructor.

History, background, philosophies, and models of pre-school education. Examines current issues and innovations.

640. Marriage and Family Group Therapy. (3)

Assessing and integrating group and family theories to treat individuals, couples, and family systems. For marriage and family therapy majors only.

645. Analysis and Treatment of Human Sexual Development. (3)

Prerequisite: FamSc. 650.

Knowledge and skill required to analyze and treat questions related to human sexual development.

650. Theoretical Foundations of Marital and Family Therapy. (3)

Epistemological and theoretical issues in marital and family therapy, including normal family processes and personal and intergenerational family issues.

651. Psychopathology and Assessment in Marriage and Family Therapy. (3)

Interpreting and assessing mental disorders and dysfunctional relationships. Etiology and diagnosis of individual, marital, and family psychopathology.

652. Marital and Individual Psychotherapy. (3)

Assessment, intervention techniques, therapist's role, and principle processes in theories of systemic individual and marital psychotherapy. For marriage and family therapy majors only.

653. Family and Multigenerational Psychotherapy. (3)

Systemic theories and strategies to diagnose and treat specific problems in dysfunctional families. For marriage and family therapy majors only.

654. Issues of Gender and Ethnicity. (3)

Gender, ethnic, and minority issues in family systems, society, and clinical practice as they relate to individual, marital, and family treatment.

655R. Intermediate Practicum in Marriage and Family Therapy. (1-4)

Prerequisite: FamSc. 555R, 650, or equivalent.

Experience in counseling individuals, premarital and marital dyads, families, groups of dyads, and multiple families. For marriage and family therapy majors only.

656. Ethical, Legal, and Professional Issues for Family Therapists. (3)

For marriage and family therapy majors only.

660.(FamSc.-Soc.) Parent-Child Interaction. (3)

Developing and testing conceptual models of parent-child interaction.

662. Human Ecology in Developing Countries. (3) On dem.

Interdisciplinary seminar on problems common to families in Third World countries and current approaches to basic needs.

675. Human Resource Allocation and Development. (3)

Prerequisite: FamSc. 540, 570, or consent of instructor.

Influence of family decisions and economic factors in creation and use of human resources. Interaction of family decision making and public policy programs on human resource development.

676. Organization, Administration, and Evaluation of Home Economics Education Programs. (3)

678. Home Economics Cross-cultural Field Experience. (1-3) On dem.

Supervised in-field experience to plan, implement, and evaluate a project or assist in an ongoing program.

689. Theoretical Foundations in Family Life Education. (3)

Social and educational forces that affect individuals, families, and the professions of home economics and family life education.

692R. (FamSc.-Soc.) Seminar in Family Relationships. (1-3)

Premarital dyad, marital dyad, and issues in family interaction and familial roles.

693R. Independent Readings. (1-3)

699R. Master's Thesis. (6-9)

750R. Supervising Marriage and Family Therapy. (2)

Spring term focuses on theory, research, and practice of supervising marriage and family therapists. Summer term includes supervised experience. For doctoral marriage and family therapy majors only.

751. Interactional Observation and Assessment. (3)

Theory and application of interactional observation and assessment/diagnosis of individual, marital, and family systems related to affective, behavioral, and cognitive disorders.

752. Addictions and Family Violence. (3)

Assessment and treatment of multiple-problem family systems, emphasizing addictions and abuse. For doctoral marriage and family therapy majors only.

753. Family Therapy with Special Populations. (3)

Advanced approaches in treating dysfunctional individual, marital, and family systems. For doctoral marriage and family therapy majors only.

755R. Advanced Practicum in Marriage and Family Therapy. (1-4)

Prerequisite: FamSc. 650, 655R, or equivalent.

For doctoral marriage and family therapy majors only.

770R. Clinical Internship. (1)

Full-time family therapy training and practice at an approved agency.

791R. Seminar in Human Development. (1-2)

Prerequisite: must be a Ph.D. candidate in human development.

792R.(FamSc.-Soc.) Family Symposium. (0.5)

Presentation and discussion of professional papers about the family.

793R. Research Seminar in Marriage and Family Therapy. (1-3)

Integrating and applying research design and statistics to the study of marital and family therapy. For doctoral majors in marriage and family therapy only.

794R. Special Topics in Child Development. (1-2)**799R. Doctoral Dissertation.** (1-9)

Family Studies

Coordinator: Bruce A. Chadwick, 875 SWKT, 378-3374

The Family Studies Program is a doctoral program, jointly sponsored by the Sociology and Family Sciences departments; it awards the Ph.D. from one of the two departments. Requiring competency in family theory, research methods, statistics, and educational methods, the program trains individuals to be professional researchers and teachers. Competencies unique to the sociology option are sociological theory and one additional area such as social organization, social psychology, deviant behavior, race relations, or demography. Competencies unique to the family science option are child development, marriage and family therapy, family life education, and family resource management.

Graduate Program and Degree

Family Studies (Ph.D.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Family Studies (Ph.D.)**Admission and Entry****I. Application requirements:**

A. Deadline: February 1. Applications should be submitted well before deadline to allow for graduate admissions processing.

B. Sample of written work (i.e., master's thesis).

II. Prerequisite: Master's degree or equivalent.**III. Entry times:** Usually fall semester, but under very unusual circumstances students may enter at other times.**Requirements for Degree**

I. Credit hours (66): Minimum 48 course work hours plus 18 dissertation hours (FamSc.-Soc. 799R).

II. Required courses: FamSc.-Soc. 560, 600, 603R, 692R (9 hours or 6 hours plus 660), 792R (4 hours), 799R; FamSc. 565; Soc. 606, 706.

III. Additional courses:

A. Family Sciences Department option: FamSc. 510, 511, 512 or 513; plus 514, 540, 556, 642, 665, 765.

B. Sociology Department option: Soc. 601, 610, 611, 700, 711, plus 6 hours from one of the following areas: demography and human ecology, deviant behavior, race and ethnic relations, social organization, social psychology.

IV. Minor: Any approved.

V. Skill requirement: Consult department.

VI. Written examinations.

VII. Dissertation.

VIII. Examination: Oral defense of dissertation.

Food Science and Nutrition

Chair: Mark J. Rowe, 475 WIDB, 378-3912

Graduate Coordinator: Lynn V. Ogden, 475 WIDB, 378-6038

Faculty/Specialties**Professors**

Hill, John M. (1971) Ph.D., Rice University, 1965.

Nutritional Biochemistry, International Nutrition.

Huber, Clayton S., Dean (1976) Ph.D., Purdue University, 1968. Food Chemistry, Food Preservation, Food Processing.

Johnson, John Hal (1969) Ph.D., Ohio State University, 1963. Food Science, New Product Development, Shelf Life of Foods.

Rowe, Mark J. (1987) Ph.D., Brigham Young University, 1972. Molecular Biology, Mitochondrial Gene Expression.

Woolley, Bruce H. (1977) Pharm. D., University of Southern California, 1972. Pharmacology.

Associate Professors

Franz, Kay B. (1968) Ph.D., University of California, Berkeley, 1978. Human Nutrition, Mineral Absorption, Metabolism.

Ogden, Lynn V. (1984) Ph.D., University of Minnesota, St. Paul, 1973. Food Chemistry, Dairy Products, Food Processing, Sensory Analysis.

Assistant Professors

Brown, Lora B. (1974) Ed.D., Brigham Young University, 1982. Point-of-Choice Nutritional Education.

Christensen, Merrill J. (1982) Ph.D., Massachusetts Institute of Technology, 1982. Selenium Metabolism, Molecular Biology.

Nyland, Nora K. (1982) Ph.D., Kansas State University, 1989. Dietetics, Institutional Management.

Pike, Oscar A. (1986) Ph.D., Purdue University, 1986. Food Chemistry: Lipid Oxidation, Food Processing and Storage.

Graduate Programs and Degrees

Food Science and Nutrition (M.S.)

Food Science (M.S.)

Nutrition (M.S.)

Areas of Emphasis

New product development, food preservation and processing, food chemistry, lipid oxidation, nutrient stability, sensory analysis, mineral nutrition, international nutrition, clinical nutrition, mitochondrial gene expression, molecular biology.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements*

Food Science and Nutrition (M.S.)

Food Science (M.S.)

Nutrition (M.S.)

Admission and Entry

I. Application requirements:

- A. Deadlines: University deadlines apply.
- B. Entrance examination: General GRE: score subject to review.

II. Prerequisite: Undergraduate major in food science, nutrition, dietetics, or a closely related field.

Requirements for Degree

- I. Credit hours (30). Minimum 24 course work hours plus 6 thesis hours (FSN 699R).
- II. Required courses:
 - A. Food science program: FSN 652, 654, 656, 691R.
 - B. Nutrition program: FSN 531, 532, 631R, 691R.
 - C. Food science and nutrition program: Both A and B above.
- III. Minor: Selected with approval of faculty advisor.
- IV. Thesis: Standard university thesis format or journal publication format.
- V. Examination: Oral examination on course work and defense of thesis.

*Obtain a copy of the Graduate Student Handbook from department office (475 WIDB).

Program and Degree Resources

Western Dairy Food Research Center

Dairy Products Laboratory

Sensory Laboratory

Ezra Taft Benson Quality Assurance Laboratory

Food Science and Nutrition Graduate Courses

531. Advanced Human Nutrition 1. (3)

Prerequisite: FSN 435 or equivalent.

Nutritional status and basis of recommendations for carbohydrates, lipids, protein, and energy.

532. Advanced Human Nutrition 2. (3)

Prerequisite: FSN 435 or equivalent.

Nutritional status and basis of recommendations for vitamins, minerals, and water.

631R. Selected Topics in Food Science and Nutrition. (1-3)

Prerequisite: FSN 531, 532, or consent of instructor.

Subjects that may be offered include:

- Current Controversies
- Diabetes
- Diet and Cancer
- Diet and Cardiovascular Disease
- Eating Disorders
- Food Additives
- Gerontology
- Minerals

- Nutrition Education
- Nutrition During Pregnancy and Infancy
- Obesity and Weight Control
- Protein
- Sports Nutrition
- Vitamins

638. Advanced Clinical Nutrition. (4)

Prerequisite: FSN 300, 356, 531, 532.

Theory, techniques, and practices.

639. Advanced Public Health Nutrition. (3)

Prerequisite: FSN 400, 531, 532.

Program planning, management, and evaluation.

652. Carbohydrates and Their Reactions in Foods. (3)

Prerequisite: FSN 450 or equivalent.

Sugars, higher saccharides, starches, pectins, gums, hemicelluloses, celluloses, and their derivatives: their functions and reactions in foods.

654. Proteins and Their Reactions in Foods. (3)

Prerequisite: FSN 450 or equivalent.

Plant and animal proteins and their functions and changes during food processing; food enzyme properties.

656. Food Lipids and Their Reactions in Foods. (3)

Prerequisite: FSN 450 or equivalent.

Lipids and their reactions in foods with other components of the food system and/or the surrounding environment; lipid processing techniques.

691R. Graduate Seminar. (1-2)

697R. Research. (1-3)

699R. Master's Thesis. (1-9)

Geography

Chair: Dale J. Stevens, 690-C SWKT, 378-3851

Graduate Coordinator: Alan H. Grey, 690-F SWKT, 378-4116

Faculty/Specialties

Professors

- Grey, Alan H. (1964) Ph.D., University of Wisconsin, Madison, 1963. New Zealand, General, Historical.
- Hudman, Lloyd E. (1970) Ph.D., University of Kansas, 1970. Urban Geography, Travel and Tourism.
- Jackson, Richard H. (1969) Ph.D., Clark University, 1970. North America, Culture, Planning.
- Stevens, Dale J. (1966) Ph.D., University of California, Los Angeles, 1969. Weather, Europe, Landforms.

Associate Professors

- Ford, Robert E. (1988) Ph.D., University of California, Riverside, 1982. Rural Development, Cultural Ecology, Political, Africa, Middle America.
- Hinckley, Thomas K. (1972) Ph.D., University of Western Ontario, Canada, 1979. Cartography.

Assistant Professor

- Hardin, Perry J. (1988) Ph.D., University of Utah, 1989. Cartography, Geographic Information Systems, Remote Sensing.

Graduate Programs and Degrees

Cartography (M.S.)

Geography (M.S.)

Planning (M.S.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Cartography (M.S.)

Geography (M.S.)

Planning (M.S.)

This program is designed to provide a general background at the graduate level for either a terminal degree or preparation for more advanced work.

Admission and Entry

- I. Application requirements:
Deadlines: University deadlines apply.
- II. Prerequisite:
A. Undergraduate minor in geography or equivalent.
B. Strong language background for area studies emphasis.
C. Business mathematics or statistics background for business or industry emphasis.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Geog. 699R).
- II. Required courses: Geog. 600R (2 credit hours), 601, 620, 699R.
- III. No more than 7 hours total from cooperative education (see below), special problems, or readings courses may be applied toward the degree.
- IV. Minor: Supporting courses chosen in consultation with committee.
- V. Thesis.
- VI. Examination: Oral defense of thesis.

Geography Graduate Courses**501R. Topics in Systematic Geography. (1-3)**

Detailed investigation of selected systematic topics; emphasis on current world affairs and problems.

502R. Seminar in Regional Geography. (1-3)**510. Practices of Land Use Planning. (2)**

In-depth analysis of the comprehensive planning process; emphasizes alternative methods of creating and implementing a plan.

512. Cartographic Reproduction. (3)

Prerequisite: Geog. 312, 411, 412.

Color map production using separations and precision registration for reproduction.

513.(Geog.—Civ.E.) Photogrammetry and Remote Sensing. (3)

Prerequisite: CivE. 113.

Using data obtained from visible portion (photographs) and broader range (radiometers, radar, microwaves,

infrared, remote, etc.) of electromagnetic spectrum to solve engineering problems. Maps, mapping procedures, and photo and electronic data interpretation.

515. Geographic Information Systems (GIS). (2)

Prerequisite: Geog. 211, 212.

Applying GIS techniques to solving geographic problems in natural and cultural environments, emphasizing planning and resource management.

517. Analytical Cartography. (2)

Prerequisite: CS 103 or 142, Geog. 515.

Geocoding, spatial data representation, map-based transformations, and cartographic modeling.

520. Spatial Analysis. (3)

Using quantitative and location-allocation models to determine and account for location of economic, social, religious, and public institutions in their service regions.

580. Geography of the Developing World. (3)

Prerequisite: consent of instructor.

Analysis and description of the developing world from a spatial perspective; focus on current policy issues, theories, and management practices.

599R. Cooperative Education. (1-3)

On-the-job experience. No more than 3 hours in cooperative education may apply toward any one degree.

600R. Graduate Colloquium. (1)

Prerequisite: graduate standing.

Nature of geographical investigation and the problems of graduate work.

601. Seminar in Physical Geography. (2)**610. Planning: Analysis and Implementation. (2)**

Prerequisite: Geog. 310, 510.

Research seminar on planning theory; critical evaluating models and theories; uses a case study approach.

612. Seminar in Cartographic Information Analysis. (2)

Prerequisite: Geog. 511, 512, 515.

Integration of remote sensing, geographical information systems, photogrammetry, and field work for solving geographic mapping problems.

620. Seminar in Cultural Geography. (2)**690R. Readings. (1-2)****695R. Special Problems. (1-3)****699R. Master's Thesis. (1-6)****Geology**

Chair: Dana T. Griffen, 258 ESC, 378-3918

Faculty/Specialties**Professors**

Baer, James L. (1969) Ph.D., Brigham Young University, 1968. Geologic Engineering.

Benson, Alvin K. (1986) Ph.D., Brigham Young University, 1972. Geophysics.

Best, Myron G. (1965) Ph.D., University of California, Berkeley, 1961. Petrology, Tectonics.

- Griffen, Dana Thomas (1979) Ph.D., Virginia Polytechnic Institute, 1975. Mineralogy, Crystallography.
- Hamblin, William Kenneth (1962) Ph.D., University of Michigan, Ann Arbor, 1958. Sedimentation.
- Miller, Wade E. (1971) Ph.D., University of California, Berkeley, 1968. Vertebrate Paleontology.
- Petersen, Morris S. (1966) Ph.D., University of Iowa, 1962. Invertebrate Paleontology.

Associate Professors

- Christiansen, Eric H. (1986) Ph.D., Arizona State University, 1981. Petrology, Geochemistry.
- Keith, Jeffrey D. (1990) Ph.D., University of Wisconsin, 1982. Economic Geology, Geochemistry.
- Kowallis, Bart J. (1982) Ph.D., University of Wisconsin, Madison, 1981. Structural Geology.
- Mayo, Alan L. (1987) Ph.D., University of Idaho, 1981. Hydrogeology.

Assistant Professor

- Morris, Thomas H. (1990) Ph.D., University of Wisconsin, Madison, 1986. Sedimentology, Stratigraphy.

Graduate Programs and Degrees

Geology (M.S.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Geology (M.S.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: Applications, including requests for financial aid, received before March 15 for fall semester or September 15 for winter semester will receive priority consideration.
 - B. Entrance examination: General GRE (Q, V, A); minimum 50th percentile score. GRE scores must be received in the Geology Department before application for admission will be considered.
 - C. GPA: Minimum 3.0 GPA overall and in all physical sciences (mathematics, chemistry, computer science, physics) as well as in geology courses.
- II. Prerequisite: Baccalaureate degree. Arrangements to satisfy undergraduate deficiencies will be made in consultation with graduate coordinator.
- III. Entry times: Fall and winter semesters only.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Geol. 699R).
- II. Required courses: To be determined in consultation with advisor.
- III. Publishable thesis.
- IV. Examinations:
 - A. Comprehensive oral examination on course work.
 - B. Final oral defense of thesis.

Geology Graduate Courses

- 502. Geology for Teachers.** (2) On dem.
Prerequisite: Geol. 101, 103; or 111, 112.
Materials and methods useful for junior and senior high school earth science teachers.
- 510. Conducted Field Trips.** (1) F, W, Sp, Su
Prerequisite: any college-level geology course and consent of instructor.
Geology field trips.
- 511. Advanced Structural Geology.** (3) Alt. F
Prerequisite: Geol. 311, 410.
In-depth discussions of a variety of topics in structural geology, emphasizing current literature and problems.
- 512. Geology of North America.** (4) Alt. W
Prerequisite: Geol. 311.
Region-by-region study of the area geology, physiography, and geologic development of North America.
- 520. Petroleum Geology.** (3) Alt. W
Prerequisite: Geol. 311, 370.
Origin, migration, and entrapment of liquid and gaseous hydrocarbons.
- 521. Borehole Geophysics and Geology.** (3) Alt. F
Prerequisite: Phscs. 105, 106—or 121, 122; Geol. 351, 370.
Applied well log analysis, including conventional and new techniques. Subsurface geology and lithology determined from electrical, acoustical, radioactive, and other logs.
- 545. Isotope Geochemistry.** (3) On dem.
Prerequisite: Geol. 352.
Use of stable and radioactive isotope systematics in geochronology and investigation of origins of rocks and waters.
- 550. X-Ray Crystallography** (3) On dem.
Prerequisite: Geol. 351, Phscs. 221.
Theory and geologic applications of X-ray crystallography using both powder and single crystal X-ray diffraction methods.
- 551. Advanced Mineralogy.** (3) Alt. W
Prerequisite: Geol. 351, Phscs. 221.
Crystallography, structure, and crystal chemistry of major silicate mineral groups.
- 552. Instrumental Methods.** (4) Alt. W
Prerequisite: Geol. 352, 451.
Modern laboratory methods for analyzing rocks and minerals; spectrometry, X-ray diffraction, electron microscopy.
- 556. Applied Geomathematics.** (3) Alt. F
Prerequisite: Math. 112, 113, Phscs. 121, 122.
Applications of algebra, geometry, trigonometry, calculus, matrices, computers, and statistics to the analysis and interpretation of geoscience data.
- 559. Applied Geophysics 1.** (3) Alt. F
Prerequisite: Geol. 311, Phscs. 221.
Principles, tools, and methods in gravity, magnetic, and electromagnetic exploration. Includes acquisition, processing, and interpretation of gravity and magnetic data.

560. Applied Geophysics 2. (3) Alt. W
Prerequisite: Geol. 311, 559, Phscs. 221.

Principles, tools, and methods used in seismic geophysics, with engineering, environmental, exploration, and hydrological applications. Includes acquisition, processing, and interpretation of seismic data.

561. Ore Deposits. (3) On dem.
Prerequisite: Geol. 460.

Origin, classification, and distribution of metallic ore deposits.

574. Principles of Stratigraphy. (3) Alt. W
Prerequisite: Geol. 370.

Study of the stratigraphic record.

580. Principles of Paleontology. (3) Alt. W
Prerequisite: Geol. 480.

Modern approaches to fossil study applied to areas of evolution, paleoecology, and biostratigraphy.

582. Biostratigraphy. (3) Alt. W
Prerequisite: Geol. 480 or 580.

Fossils in their stratigraphic setting and principles of paleontologic chronology.

586. Vertebrate Paleontology. (4) Alt. F
Prerequisite: Geol. 112, 286, or any basic course in zoology.

History of vertebrate fossils. Field trips required. Credit applies in either zoology or geology. Laboratory studies.

590R. Short Courses. (1–3) On dem.
Short graduate-level courses offered on a random basis.

591R. Seminar. (0–0.5) F, W
Seminars on various geologic topics by guest speakers. Total of 1 credit hour required.

599R. Cooperative Education. (1–9V) F, W, Sp, Su

635. Advanced Hydrogeology. (3) Alt. F
Prerequisite: Geol. 435, Math. 321, or concurrent registration.

Equations governing fluid flow through saturated porous media under various geologic conditions; applying hydraulic characteristics to analysis of well and aquifer conditions.

636. Hydrogeochemistry. (3) On dem.
Prerequisite: Geol. 435 or consent of instructor, Chem. 106 and 107, or 112.

Nature and origin of solutes and isotopes in groundwater systems. Applying geochemistry to evaluation of groundwater recharge conditions and flow patterns.

637. Groundwater Modeling. (3) Alt. W
Prerequisite: Geol. 435 or consent of instructor, Chem. 106 and 107, or 112.

Computer modeling and groundwater systems.

655. Igneous Petrology. (3) On dem.
Prerequisite: Geol. 552.

Origin and crystallization behavior of magmas, emphasizing crystal-liquid relations in simple experimental systems.

671. Sedimentary Petrology—Carbonate Rocks. (3) On dem.

Prerequisite: Geol. 370.

Characteristics and significance of limestones and dolomites.

672. Sedimentary Petrology—Clastic Rocks. (3) Alt. W
Prerequisite: Geol. 370.

Characteristics and significance of conglomerates, sandstones, and shales.

685. Paleoecology. (4) Alt. F
Prerequisite: Geol. 480 or 580.

Ancient environments and ecology of major taxonomic groups.

695R. Research. (1–4) F, W, Sp, Su

696R. Readings and Conferences in Geology. (1–4) F, W, Sp, Su

697R. Directed Field Studies. (1–6) F, W, Sp, Su

699R. Master's Thesis. (6–9) F, W, Sp, Su

Health Sciences

Chair: L. McKay Rollins, 213 RB, 378-4428
Graduate Coordinator: Richard Hurley, 229-D RB, 378-2360

Faculty/Specialties

Professors

Burgener, O. Robert (1964) Ph.D., University of Utah, 1972.
Community Health, Environmental Health.

Hafen, Brent Q. (1969) Ph.D., Southern Illinois University, 1969. Behavioral Health, Research.

Heiner, Steven W. (1969) Ed.D., University of Utah, 1969.
Gerontology, Social Hygiene.

Karren, Keith J. (1971) Ph.D., Oregon State University, 1975. Behavioral Health.

Rhodes, Ronald L. (1962) Ph.D., Oregon State University, 1971. Health Promotion, Physiology.

Rollins, L. McKay (1962) Ph.D., University of Utah, 1971.
International Health, Administration.

Thygerson, Alton L. (1967) Ed.D., Brigham Young University, 1969. Safety and Curriculum, Occupational Health and Safety.

Associate Professor

Hurley, D. Richard (1971) Ph.D., Southern Illinois University, 1971. Statistics, Research.

Assistant Professor

Coon, Paul E. (1972) M.S., Brigham Young University, 1972. Curriculum, Teaching Methods.

Petersen, Ray (1969) M.S., Brigham Young University, 1965. School Health, Consumer Health.

Salazar, Richard D. (1963) Ph.D., Southern Illinois University, 1972. Research Methods, Statistics.

Graduate Programs and Degrees

Health Sciences (M.S.)

Health Sciences (M.H.Ed.)

Areas of Emphasis

Community health, health promotion, school health.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Health Sciences (M.S.)

Health Sciences (M.H.Ed.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: General GRE; score subject to review.
 - C. GPA: Minimum of 3.0 for last 60 hours of undergraduate work.
- II. Prerequisite:
 - A. Baccalaureate degree with a major or minor in community health, health education, health promotion, biological sciences, nursing, physical education, therapeutic recreation, or other allied fields.
 - B. Applicants will be required to satisfy any deficiencies. Courses taken in doing so will not count toward the required hours for the degree.

Requirements for Degree

- I. Credit hours:
 - A. Master of science (M.S.) (31): Minimum 25 course work hours plus 6 thesis hours (Hlth. 699R).
 - B. Master of health education (M.H.Ed.) (34): Minimum 30 course work hours plus 4 project hours (698R).
- II. Required core courses in all emphases: Stat. 552; Hlth. 650, 651, 692, 694.
- III. Required courses in various emphases:
 - A. Community health:
M.S.: Hlth. 552, 570, 578, and 6 course work hours plus 6 thesis hours (699R);
M.H.Ed.: Hlth. 552, 570, 578, and 11 course work hours plus 4 project hours (698R).
 - B. School health:
M.S.: Hlth. 552, 565, 661, and 6 course work hours plus 6 thesis hours (699R);
M.H.Ed.: Hlth. 552, 565, 661, and 11 course work hours plus 4 project hours (698R).
 - C. Health promotion:
M.S.: Hlth. 555, 565, 599R, and 7 course work hours plus 6 thesis hours (699R);
M.H.Ed.: Hlth. 555, 565, 599R, and 12 course work hours plus 4 project hours (698R).
- IV. Thesis or project: Hlth. 692 and Stat. 552 should be taken the first semester or as early as possible in preparation for the thesis or project.
- V. Examinations:
 - A. Oral defense of thesis (M.S.).
 - B. Oral defense of project and oral examination on course work (M.H.Ed.).

Health Sciences Graduate Courses

502R. Driver and Safety Education Workshop. (1-7)

Independent Study also.

Current safety education problems.

503R. Health Problems Workshop. (1-7)

Current problems in school and community health.

—Health Education Workshop

—Grant Writing

—Health and Wellness, Screening and Evaluation

—Women's Health

—Fertility, Pregnancy, and Childbirth

—Contemporary Health Issues and Problems

—Adolescent Health Problems

—Alternate Approaches to Health and Wellness

—Marketing and Organizing Conferences, Workshops, and Seminars—Wilderness Medicine

525. Injury Prevention. (2)

Conducting various injury prevention programs; injury-related data and literature.

536. Social Hygiene. (2)

Preparing prospective teachers to instruct in family life education as it relates to health. Emphasizes sexual maturation, family health problems, parenthood, and other social hygiene factors.

552. Health Education Program Planning. (2)

Principles of health education program design, administration, marketing, and evaluation.

555. Health Promotion. (3)

Management for effectively designing, marketing, implementing, and administering health promotion programs.

561. Health of the Body Systems. (3)

Prerequisite: Zool. 261.

Advanced course in health problems dealing with the major factors in health and disease as they affect the several body systems.

563. Health and the Aging Process. (2)

Independent Study also.

Theories of aging—as a normal process, as a pathological process; health promotion and extension of life.

565. Behavioral Health. (2)

Applying behavioral principles and techniques related to health promotion.

570. Environmental Health. (2)

Prevalent environmental hazards as they affect people's health.

578. Epidemiology for Health. (2)

Prerequisite: Mcbio. 221 or consent of instructor.

Applying analytical tools to the study of acute and chronic disease prerequisite to disease control.

580. International Health. (2)

Health values, beliefs, and practices of other cultures, emphasizing how these beliefs and practices affect health and well-being.

- 599R. Cooperative Education.** (Arr.)
Prerequisite: completion of a major in health sciences or graduate student status in health sciences.
On-the-job experience.
- 650. Review and Processing of Health Information.** (3)
Source evaluation and content review of contemporary research in health sciences.
- 651. Community Organization for Health.** (2)
Theory and practices in community organization for health. Evaluating group work methods and leadership theories. Field observations required.
- 661. Curriculum Development and Instructional Design.** (2)
Design and evaluation of health education curricula.
- 671. Graduate Practicum.** (1)
Role and functions of the college health teacher. Supervised experience in teaching and research.
- 692. Research Methods in Health Sciences.** (3)
Designing, analyzing, and writing research. Focuses on methodological skills.
- 694. Graduate Seminar in Health Sciences.** (2)
- 696R. Independent Studies.** (1-3)
- 698R. Master's Project.** (4)
- 699R. Master's Thesis.** (1-9)
- 796R. Individual Research and Study.** (2-9)
- 799R. Doctoral Dissertation.** (1-18)

History

Chair: Paul B. Pixton, 323 KMB, 378-4335
Graduate Coordinator: Arnold H. Green, 418 KMB, 378-3408

Faculty/Specialties

Professors

- Addy, George M. (1957) Ph.D., Duke University, 1957.
Colonial Latin America, Spain.
- Alexander, Thomas G. (1964) Ph.D., University of California, Berkeley, 1965. Late Nineteenth- and Twentieth-Century United States, Western America, Mormon History.
- Allen, James B. (1963) Ph.D., University of Southern California, 1963. U.S., Western America, Mormon History.
- Britsch, R. Lanier (1966) Ph.D., Claremont Graduate School, 1967. Asian Religions, Missiology.
- Flammer, Philip M. (1973) Ph.D., Yale University, 1963. Military, American Diplomatic History.
- Fox, Frank W. (1971) Ph.D., Stanford University, 1973. Modern U.S., U.S. Cultural History.
- Gowans, Frederick R. (1972) Ph.D., Brigham Young University, 1972. Western America, American Indian, Fur Trade.
- Green, Arnold H. (1985) Ph.D., University of California, Los Angeles, 1973. Modern Near East.
- Hill, Marvin S. (1966) Ph.D., University of Chicago, 1968. U.S. Intellectual and Social History.

- Johnson, G. Wesley (1984) Ph.D., Columbia University, 1967. Africa, Public.
- Montgomery, David C. (1970) Ph.D., Indiana University, Bloomington, 1971. Central Asia, Middle East, Central Asian and Middle Eastern Languages.
- Pixton, Paul B. (1974) Ph.D., University of Iowa, 1972. Medieval Europe.
- Thorp, Malcolm Ray (1969) Ph.D., University of Wisconsin, Madison, 1972. Early Modern and Modern Britain.
- Tobler, Douglas F. (1967) Ph.D., University of Kansas, 1967. Modern Germany, European Intellectual History.
- Warner, Ted J. (1962) Ph.D., University of New Mexico, 1963. Spanish and Mexican Borderlands, American Indian, Western America.
- Associate Professors**
- Bohac, Rodney D. (1983) Ph.D., University of Illinois, 1982. Russia, Rural Europe.
- Chandler, David Lee (1970) (on leave) Ph.D., Tulane University of Louisiana, 1972. Modern Latin America, Bolivarian States, Latin American Indian and Peasant.
- Holmes, Blair R. (1971) Ph.D., University of Colorado, Boulder, 1972. European Family, Social History.
- Kenzer, Robert C. (1982) Ph.D., Harvard University, 1982. Family, Nineteenth-Century America—South.
- Pratt, David H. (1966) Ph.D., University of Nebraska, Lincoln, 1975. British Family, Modern English.
- York, Neil Longley (1977) Ph.D., University of California, Santa Barbara, 1978. Colonial History, Technology, American Revolution.

Assistant Professors

- Johnson, Marian A. (1984) Ph.D., Stanford University, 1980. Art History, Oral History.
- Stovall, Mary E. (1983) Ph.D., University of Chicago, 1983. Family, Nineteenth-Century America—South, Twentieth-Century Southern Novelists.
- Westover, V. Robert (1971) Ph.D., Arizona State University, 1979. Family, American Indian.

The following people in other departments have also been granted academic rank by the Department of History:

- Griggs, C. Wilfred. Greece and Rome.
- Hall, John F., III. Greece and Rome.
- Madsen, Carol Cornwall. LDS Church History.
- Walker, Ronald W. LDS Church History.
- Whittaker, David J. American West.

Graduate Programs and Degrees

History (M.A.)
History (Ph.D.)

The Department of History is now accepting applications to its graduate programs for Fall 1991.

The Department of History at Brigham Young University offers both the M.A. degree and the Ph.D. degree in selected fields of strength, particularly those of European intellectual, American social, western American, Mormon, family, community, and public history. Opportunity is provided for those whose primary career objectives are directed toward teaching at the secondary level, specialized research and teaching at the college/university level, or employment in the nonacademic sector. Students

desiring a master's degree in Latin American, Asian, or Middle Eastern history should apply to the relevant program in the David M. Kennedy Center for International Studies.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

History (M.A.)

Emphases: American and modern European.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: March 1.
 - B. At least three letters of recommendation from persons familiar with applicant's academic qualifications, preferably professors.
 - C. Sample of applicant's work: Send directly to the department a research paper such as a senior seminar paper.
- D. Entrance examinations:
 1. Graduate Record Examination.
 2. Students whose native language is not English must pass the TOEFL examination at the 85th percentile or higher (a score of 582).
- E. GPA: Minimum of 3.0 for last 60 hours.
- F. Inquire of the History Department for further details before applying for admission.
- II. Prerequisite: Undergraduate degree in history or equivalent.
- III. Entry times: Fall semester only.

Requirements for Degree

- I. Course requirements:
 - A. American history emphasis. Credit hours (30): Minimum of 24 course work hours including Hist. 587, 690R; two courses selected from Hist. 561, 562, 563; plus 6 thesis hours (699R).
 - B. Modern European history emphasis. Credit hours (30): Minimum of 24 course work hours including Hist. 587, 690R; two courses selected from Hist. 661, 662, 663; plus 6 thesis hours (699R).
- II. Minor: Optional as approved by advisory committee.
- III. Thesis.
- IV. Examinations:
 - A. Written comprehensive.
 - B. Oral defense of thesis.

History (Ph.D.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: March 1.
 - B. At least three letters of recommendation from persons familiar with applicant's academic qualifications, preferably professors.
 - C. A copy of applicant's master's thesis, sent directly to the department.

D. Entrance examinations:

1. Graduate Record Examination.
 2. Students whose native language is not English are required to pass the TOEFL examination at the 85th percentile or higher (a score of 582).
- E. GPA: Minimum 3.4 for last 60 hours.
- F. Inquire of the History Department for further details before applying for admission.
- II. Prerequisite: Master's degree in history or equivalent.
- III. Entry time: Fall semester only.

Requirements for Degree

The student should select either modern European history or American history as his or her major field. The other will become the secondary field. All students will be required to take all three of the European core courses and all three American core courses.

A student may specialize in an area within the major field as approved by the departmental graduate committee and the committee chair. Except in unusual cases, the fields of emphasis in American history are western America, history of religion in America, and American social history.

- I. Credit hours (54 beyond baccalaureate): Minimum 36 course work hours beyond the baccalaureate plus 18 dissertation hours (Hist. 799R).
- II. Course requirements:
 - A. First year in residence: See Class Schedule; consult with advisor.
 - B. Core courses for European history emphasis: 661, 662, 663.
 - C. Core courses for American history emphasis: 561, 562, 563.
 - D. Other courses to be determined by advisory committee.
- III. Progress review: After 18 hours of course work, there will be an oral progress review in which the student's graduate committee will determine whether the student has proved competent to remain in the program. Students should finish all course work and tool requirements and pass the written comprehensive examinations within three years after beginning the program.
- IV. Skill requirement: Consult department.
- V. Dissertation prospectus: Presented upon successful completion of the oral comprehensive examination.
- VI. Dissertation.
- VII. Examinations:
 - A. Written comprehensive examinations: A Ph.D. candidate will offer for comprehensive examination a general field (major area), a field of specialization within that general field, and a secondary field in history. The candidate will also present a minor field outside history, chosen in consultation with the committee chair.
 - B. Oral comprehensive examination: Given after student successfully passes the written comprehensive examination.
 - C. Oral defense of dissertation.

Program and Degree Resources

Camilla Eyring Kimball Chair of Home and Family Life
Charles Redd Center for Western Studies and Lemuel H.
Redd, Jr., Chair in Western History
Joseph Fielding Smith Institute for Church History
Museum of Peoples and Cultures
Women's Research Institute
Center for Studies of the Family

History Graduate Courses

500R. Special Studies in History. (1-3)

Directed by visiting or resident faculty. Check with department secretary for current topics and instructor.

561. Sources and Problems in Early America. (3)

Through the seventeenth and eighteenth centuries. Required of American and European history graduate students.

562. Sources and Problems in Nineteenth-Century America. (3)

Through the nineteenth century. Required of American and European history graduate students.

563. Sources and Problems in Twentieth-Century America. (3)

Through the twentieth century. Required of American and European history graduate students.

587. Philosophies of History. (3)

Fundamental problems and types of historical analysis and interpretation, philosophies of history, and work of outstanding historians.

590R. Special Topics. (3)

Western American, religious, family, Asian, Latin American, and Near Eastern history.

598R. Special Readings in History. (1-2)

661. Sources and Problems in Medieval, Renaissance, and Reformation History. (3)

Selected topics in medieval, Renaissance, and Reformation history.

662. Sources and Problems in Early Modern Europe, 1550-1789. (3)

Selected topics in early modern Europe, 1550-1789. Part of the core curriculum for graduate students.

663. Sources and Problems in Modern Europe, 1789-Present. (3)

Selected topics in nineteenth- and twentieth-century Europe, 1789-present.

690R. Graduate Seminar in History. (1-3)

695R. Coordinated Research. (3)

Student research directed by faculty member on topic of mutual interest. Prior approval of instructor required. Research assistants must do additional work for credit.

696R. Practicum in Public History and Family History. (1-5)

College credit for work in local archives, museums, and related areas. See department chair for openings available and to determine hours of credit.

698R. Master's Project. (1-6)

699R. Master's Thesis. (1-9)

798R. Special Readings in History. (1-2)

799R. Doctoral Dissertation. (1-18)

Humanities, Classics, and Comparative Literature

Chair: Larry V. Shumway, 3010-A JKHB, 378-4448
Graduate Coordinator: Terrell M. Butler, 3010-D JKHB, 378-3256

Faculty/Specialties

Professors

Britsch, Todd A., Dean (1966) Ph.D., Florida State University, 1966. Humanities: Art and Society, Interrelations of Arts, Winckelmann, Technology and Culture.

Peer, Larry H. (1975) Ph.D., University of Maryland, College Park, 1969. Comparative Literature: Romanticism, Theory.

Sondrup, Steven P. (1973) Ph.D., Harvard University, 1974. Comparative Literature: Scandinavian, German Literature, Nineteenth and Twentieth Century.

Tate, George S. (1974) Ph.D., Cornell University, 1974. Comparative Literature: Medieval Studies (Scandinavian, German, English, Augustine, Twelfth-Century Renaissance).

Associate Professors

Blickman, Daniel R. (1982) Ph.D., Stanford University, 1983. Classics: Greek Literature, History, and Philosophy.

Butler, Terrell M. (1979) Ph.D., Cornell University, 1979. Comparative Literature: Seventeenth-Century France, England, Italy.

Call, Michael J. (1983) Ph.D., Stanford University, 1982. Humanities: Eighteenth- and Nineteenth-Century French Literature and Arts, Romanticism, Critical Theory.

Green, Jon D. (1970) Ph.D., Syracuse University, 1972. Humanities: Interrelations of the Arts, Modernism.

Hall, John F. (1978) Ph.D., University of Pennsylvania, 1984. Classics: Roman History, Religion, and Law; Latin Literature.

Lounsbury, Richard C. (1982) Ph.D., University of Texas, Austin, 1979. Classics: Early Imperial Literature, Rhetoric, Classical Tradition in European and American Literature.

Shumway, Larry V. (1975) Ph.D., University of Washington, 1974. Humanities: Asian Humanities, Ethnomusicology.

Assistant Professors

Duckwitz, Norbert H. O. (1969) Ph.D., University of Colorado, 1987. Classics: Latin Poetry, especially Augustan; Greek Poetry; Greek and Roman Mythology.

Winters, Timothy F. (1990) Ph.D., Ohio State University, 1989. Classics: Greek and Latin Prose, Greek Drama, Epigraphy.

Graduate Programs and Degrees

Comparative Literature (M.A., Ph.D. Minor)
Humanities (M.A.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Classics

The Classics graduate program has been temporarily furloughed. Until further notice no students will be accepted into the program and no 500- or 600-level courses will be offered.

Comparative Literature

Comparative literature is the study of literature beyond the confines of any national tradition and the study of the relationships between literature and other areas of knowledge.

Program and Degree Requirements

Comparative Literature (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: General GRE
- II. Prerequisite:
 - A. Baccalaureate degree in literature.
 - B. Thorough reading knowledge (300 level) of two of the three languages required for degree.

Requirements for Degree

- I. Credit hours (33): Minimum 27 course work hours plus 6 thesis hours (CLit. 699R).
- II. Required courses: CLit. 610, 6 hours of 620R (in two different periods), 6 hours from 630R, 640R, 650R, 660R, or 690R; and 699R.
- III. Electives: 12 hours of literature.
- IV. Language requirement: Thorough reading knowledge (300 level) of three languages, one of which must be German or French, and one of which may be English for students who choose to emphasize American or English literature.
- V. Thesis.
- VI. Examination: Final oral examination and defense of thesis.

Comparative Literature (Ph.D. Minor)

Requirements for Degree Minor

- I. Credit hours: Minimum 12 course work hours.
- II. Thorough knowledge of three literary traditions, one of which must be French or German, in two periods each.
- III. All readings done in original language.
- IV. Examinations: Written and oral examinations on areas of concentration. Students may be asked to demonstrate their facility with the languages relevant to their program during either or both of the examinations.

Comparative Literature Graduate Courses

590R. Directed Readings. (1-3)

Prerequisite: consent of graduate coordinator.

610. Methods of Study in Comparative Literature. (3)

Introduction to critical study of literature: critical methods and bibliography; linguistic foundations of literature; textual scholarship; literary history, transmission, theory, and criticism; genre theory; literature and other disciplines.

620R. Studies in Periods and Movements. (3)

Prerequisite: prior or concurrent registration in CLit. 610.

Various literary periods, movements, etc., and problems of periodization. Topics vary.

630R. Studies in Literary Genres. (3)

Prerequisite: prior or concurrent registration in CLit. 610.

Various genres (e.g., novel, epic, tragedy, lyric) and problems of genre. Topics vary.

640R. Studies in Themes and Types. (3)

Prerequisite: prior or concurrent registration in CLit. 610.

Major literary themes (e.g., Faust, Don Juan, Ulysses, Arthur), types, motifs, and problems of literary typology. Topics vary.

650R. Studies in Literary Relations. (3)

Prerequisite: prior or concurrent registration in CLit. 610.

Interrelations of national literatures and figures and of literature with other areas of knowledge (art, history, law, psychology, music, etc.). Topics vary.

660R. Studies in Literary Theory. (3)

Prerequisite: prior or concurrent registration in CLit. 610.

Critical theories of literature and literary analysis. Topics vary.

670R. Tutorial Internship. (3)

Prerequisite: consent of graduate coordinator.

Individual research in cooperation with graduate faculty member, generally on problems relating to a specific national literature.

690R. Seminar in Comparative Literature. (3)

Prerequisite: CLit. 610.

Problems in comparative literature. Course content varies from semester to semester.

699R. Master's Thesis. (1-9)

Prerequisite: consent of graduate coordinator.

Humanities

Widely used in the Renaissance, the term *humanities* (*humanitas* or *studia humanitatis*) refers to the study of human intellectual and artistic creativity. Humanities is both a general academic category (inclusive of literature, history, philosophy, and the history and criticism of art and music) and a discipline in its own right with a methodology for the critical study of intellectual history and aesthetics. Pursued as a major, the field offers students unusual latitude in developing a broad and full program in the liberal arts.

Program and Degree Requirements

Humanities (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: General GRE.
- II. Prerequisite:
 - A. Baccalaureate degree in humanities, art history, history, literature, music, or philosophy.
 - B. Completion of literature course in a foreign language beyond GE foreign language requirement.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Hum. 699R).
- II. Required courses: 6 hours each of 620R (in two different periods), 690R (on different topics), 699R.
- III. Electives: 12 hours in literature, art, music, history, or philosophy. To qualify, courses must approach these disciplines from theoretical, critical, or historical perspectives.
- IV. Thesis.
- V. Examination: Final oral examination that focuses on areas of concentration but also requires some general knowledge; thesis defense.

Humanities Graduate Courses

590R. Directed Readings. (1-3)

Prerequisite: consent of graduate coordinator.

620R. Period Studies in the Humanities. (3)

Interdisciplinary study of literature, philosophy, and the arts of a particular period of cultural history. Topics vary.

690R. Seminar in the Humanities. (3)

Interdisciplinary study of problems in the humanities (e.g., interrelationships among the arts, critical theory, and models of cultural history). Topics vary.

699R. Master's Thesis. (1-9)

Prerequisite: consent of graduate coordinator.

Industrial Education

Chair: Garth A. Hill, 230 SNLB, 378-6494

Graduate Coordinator: Jerry D. Grover, 230 SNLB, 378-2023

Faculty/Specialties

Professors

Grover, Jerry D. (1968) Ed.D., Brigham Young University, 1968. Automotive Technology, Student Teaching.
 Nish, Dale L. (1967) Ed.D., Washington State University, 1967. Woods.

Associate Professors

Gheen, W. Lloyd (1978) Ed.D., Texas A&M University, 1970. Plastics, Teacher Education.
 Gonzales, Ronald F. (1977) Ph.D., Purdue University, 1982. Automotive Technology, Electronics.
 Hill, Garth A. (1972) Ph.D., Colorado State University, 1979. Metals, Teacher Education.

Martin, Loren (1982) Ed.D., Utah State University, 1973. Construction, Teacher Education.

Newitt, Jay S. (1976) Ph.D., Colorado State University, 1980. Construction.

Rogers, Leon R. (1981) Ph.D., Texas A&M University, 1989. Construction.

Assistant Professors

Christensen, Kip W. (1988) M.S., Brigham Young University, 1982. Construction, Woods, Teacher Education.

Marchant, Marlow J. (1981) Ph.D., Texas A&M University, 1986. Printing, Computers.

Weidman, Brent H. (1988) M.E., Texas A&M University, 1970. Construction Management.

Graduate Program and Degree

Industrial Education (M.S.)

Graduate programs in the Department of Industrial Education are not designed to complete teacher certification or endorsement requirements, but rather to prepare vocational and industrial leaders with the necessary knowledge and skills for leadership in teaching, supervision, and management in schools and industry.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

The M.S. degree programs in industrial education provide two options for completing graduation requirements. The student may elect the summer residency program or the full-time, on-campus program. The summer residency program consists of a minimum of three full-time summers on campus with intervening approved field experiences during fall and winter semesters.

Industrial Education (M.S., Project)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Prerequisite: A valid teaching certificate or a minimum of 30 semester hours in acceptable industrial or vocational education courses.

Requirements for Degree

- I. Credit hours (34): Minimum 34 hours, including a field project (IndE. 698R).
- II. Required courses:
 - A. History and philosophy: IndE. 610 or 615; 690.
 - B. Curriculum: IndE. 625, 645; EPsy. 501 or IS 560 or 564.
 - C. Research: IS 672 or ELdr. 661; IndE. 694R; IndE. 698R.
- III. Electives: 17 hours, including at least 8 in industrial education. Remaining hours may be from business, construction management, educational leadership, counseling, secondary curriculum, or technical depth.
- IV. Project.
- V. Examination: Written and oral defense of course work.

Industrial Education (M.S., Thesis)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Prerequisite: 30 hours of acceptable undergraduate industrial or vocational education courses, or a minimum of six years of vocational experience.

Requirements for Degree

- I. Credit hours (34): Minimum 28 course work hours plus 6 thesis hours (IndE. 699R).
- II. Required courses:
 - A. History and philosophy: IndE. 610 or 615, 690.
 - B. Curriculum: Elective.
 - C. Management: IndE. 535, 640.
 - D. Research: IndE. 694R, 699R, IS 672 or ELdr. 661, Stat. 501 or 552.
- III. Electives: 14 hours, including at least 6 in industrial education. Remaining hours may be from business, construction management, educational leadership, educational psychology, counseling, technical depth, or as approved by committee.
- IV. Thesis.
- V. Examination: Oral defense of course work and thesis.

Industrial Education Graduate Courses

505. Technology for the Elementary School. (2) Sp, Su alt. yr.

Basic concepts and activities needed to prepare elementary students to cope with their technological society.

535. Industrial/Vocational Safety Program Development. (2) Sp, Su alt. yr.

Identifying and implementing programs for safety and facilities management that comply with state and national legislation.

593R. Workshop in Industrial/Technology Education. (1-3)

Reviewing and participating in current industrial and technological advances. Limited to 3 credit hours maximum.

610. History and Legislation of Vocational and Technology Programs. (2) Sp, Su alt. yr.

Historical basis of today's vocational/technological programs with emphasis on past and current funding.

615. Philosophical Basis of Technological Programs. (2) Sp, Su alt. yr.

Rationale for vocational and technology programs, including current and future trends and social, economic, and environmental impacts.

625. Instructional Management for Vocational and Technology Courses. (2) Sp, Su alt. yr.

Identifying, developing, and implementing instructional strategies unique to vocational-technical programs.

630. Adult Vocational and Technology Programs. (2) Sp, Su alt. yr.

Identifying, developing, and implementing relevant applied technology training programs.

635. Facility Design for Vocational and Technology Programs. (2) Sp, Su alt. yr.

Developing instructional facilities and educational specifications for vocational and technology laboratories.

640. Coordination and Supervision of Vocational and Technology Programs. (2) Sp, Su alt. yr.

Methods, regulations, and policies used in supervising vocational and technical education programs.

645. Visual and Graphic Presentations in Vocational and Technology Programs. (2) Sp, Su alt. yr.

Identifying, developing, and using visual and graphic material for vocational and technology programs.

690R. Seminar. (1)

Review of latest research and developments in technology and vocational education.

694R. Readings and Conference. (1-3)

Limited to a maximum of 3 credit hours.

695R. Advanced Technological Processes. (1-3)

Developing and implementing solutions to special problems; advanced skills and concepts in traditional and emerging technology areas.

698R. Master's Project. (1-3)

699R. Master's Thesis. (1-6)

David M. Kennedy Center For International Studies

Director: Ray C. Hillam, 237 HRCB, 378-3378

Graduate Coordinator: Valerie Hudson, 237 HRCB, 378-3560

Graduate Program and Degree

International and Area Studies (M.A.)

Areas of Emphasis

The David M. Kennedy Center offers an interdisciplinary master of arts degree in international and area studies. Students select one of five different areas of emphasis:

American Studies
Asian Studies
International Development Studies
International Relations
Near Eastern Studies (Ancient)

Course work is tailored to suit the student's individual interests and career direction, and the program is multidisciplinary. Each discipline is organized differently, but most have a flexible curriculum.

The M.A. program requires 32 semester credit hours (8 required, 18 electives, 6 thesis) and may be completed in one year of full-time study. A student in the Near Eastern Studies (ancient) program may complete 31 credit hours of course work and defend two major research papers to satisfy the writing competency requirements.

Students with graduate degrees in international studies may pursue a wide range of careers, including government, international business and banking, public and private international agencies, teaching, research, and law. The broad liberal arts background acquired as part of an M.A. degree will be useful in nearly any professional field.

The M.A. in international and area studies is a strong preparation for doctoral study, law, or professional business schools. It may also serve to add an international dimension to a technical or vocational undergraduate degree, thereby giving the graduate who has international interests an edge in the career market. The M.A. is not, however, generally considered an ideal terminal degree for international business. Placement in international careers is highly competitive and often requires practical job skills in addition to the master of arts degree. Academic and career objectives should be carefully weighed to determine whether the M.A. degree will enhance graduate career opportunities.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

International and Area Studies (M.A.)

Admission is handled through the BYU Office of Graduate Studies. Application forms can be requested from Graduate Admissions, B-356 ASB, Provo, Utah 84602.

Applicants should complete all parts of the application form required by the university, with appropriate fees and transcripts, and indicate the department as International and Area Studies, code 570168. The chosen area of emphasis should be entered on the application form where a specialization is requested.

Before applying, interested persons may make an appointment with the director of graduate studies to evaluate the usefulness of an international studies degree for their career goals. Request general application information from the graduate secretary. Both persons can be reached at the David M. Kennedy Center, 237 HRCB, BYU, Provo, Utah 84602, (801) 378-2389.

Admission and Entry

- I. The program is extremely competitive, and enrollment is limited to 20.
- II. Application requirements:
 - A. Deadline: April 1. Note that this is earlier than the general university deadlines. Moreover, it is recommended that applicants apply before this date.
 - B. Entrance examination:
 1. General GRE; score subject to review. An official copy of the test scores must be submitted to Graduate Admissions (B-356 ASB), and scores should be indicated on Part D of the application form.
 2. Prelaw applicants may submit LSAT; score subject to review.
 3. Concurrent M.B.A. applicants may submit GMAT; score subject to review.
 4. International applicants: TOEFL required; minimum score of 580.
 - C. GPA: Minimum of 3.2.
 - D. Statement of intent: Indicate past intercultural experience, career goals, current professional skills, and how degree will be applied.

- E. Three letters of recommendation from persons who can comment on applicant's academic ability, motivation, and interpersonal skills.
- F. Before entry into the program, students are encouraged to have had a meaningful international experience through participation in a university-sponsored program such as Study Abroad, the Washington Seminar, or an international internship.
- III. Entry times: Fall semester only.
- IV. Prerequisite:
 - A. Baccalaureate degree.
 - B. Undergraduate background in an international field, or satisfied deficiency.
 - C. Competency in a foreign language approved by committee chair: 16 undergraduate credit hours including a 300-level conversation course; or other evidence of conversational fluency.
- V. Financial aid application deadline: April 1. The following financial aid available:
 - A. Supplementary awards, which pay full or partial tuition for qualified students, awarded on basis of academic standing.
 - B. Research assistantships, paid positions requiring 5 to 10 hours work per week.
 - C. David M. Kennedy Graduate Fellow cash grants, given yearly to outstanding candidates selected by the graduate committee; no application required.

Requirements for Degree

- I. Credit hours (32): Thesis program (8 required, 18 electives, 8 seminar, 6 thesis); nonthesis program—Near Eastern Studies (ancient)—31 course work hours.
- II. Required course work: IAS 501R (fall and winter), IAS 697R, PLSc. 680. Other courses to be determined in consultation with faculty advisor.
- III. International experience encouraged: Study Abroad, Washington Seminar, international internship.
- IV. Thesis.
- V. Examination: Oral examination on course work along with oral defense of thesis or research papers.

Concurrent Degree Program (M.A. and M.B.A.)

The David M. Kennedy Center and the BYU Graduate School of Management have a special program whereby a student can earn an M.B.A. degree and an M.A. degree in international and area studies concurrently, completing both degrees in a minimum of two and one-half years.

Separate and complete applications must be submitted to both the David M. Kennedy Center and the Marriott School of Management; however, only one Code of Honor Commitment and Confidential Report (Part B of application) is required.

International and Area Studies Graduate Courses

501R. Graduate Colloquium. (1)

Methodologies and reading. Preparation for writing competency requirements and research paper presentation. Required of all international and area studies master's candidates.

595R. Special Studies. (1-3)

Studies based on individual and program needs.

599R. International Internship. (1-9)

Professional-level internship in an international setting. Class must be coordinated through Study Abroad.

695R. Directed Individual Studies. (1-3)

697R. Seminar in International Studies. (1-3)

699R. Master's Thesis. (1-6)

Languages

Language Acquisition

Language acquisition is a college-wide program in the College of Humanities.

Graduate Program and Degree

Language Acquisition (M.A.)

Areas of Specialization

Arabic, Chinese, German, Japanese, Korean, Portuguese, Russian, Scandinavian, and Spanish.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Language Acquisition (M.A.)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Prerequisite: Baccalaureate degree and strong background in the intended language of specialization.
- III. All semesters (fall recommended).

Requirements for Degree

- I. Credit hours (33): Minimum 27 course work hours plus 6 thesis hours (699R).
- II. Required courses: Ling. 540, 600, 641, 660, 677, 699R.
- III. Departmental specialization: 12 hours determined in consultation with advisory committee. Candidates may specialize in Arabic, Chinese, German, Japanese, Korean, Portuguese, Russian, Scandinavian, or Spanish.
- IV. Language requirement: Reading and speaking ability (301/311 level) in language other than English in addition to language of specialization.
- V. Thesis.
- VI. Examination: Oral defense of thesis.

Asian and Near Eastern Languages

Chair: Masakazu Watabe, 4052 JKHB, 378-3396

Graduate Coordinator: T. Richard Chi (1031-E JKHB, 378-6273)

Faculty/Specialties

Associate Professors

Chi, T. Richard (1983) Ph.D., University of California, Los Angeles, 1983. Syntax and Semantics, Second Language Acquisition, Chinese.

Parkinson, Dilworth B. (1980) Ph.D., University of Michigan, 1982. Sociolinguistics, Computer-assisted Instruction, Arabic.

Ricks, Stephen David (1981) Ph.D., University of California, Berkeley, 1982. Hebrew, Near Eastern Languages, History of Religions.

Russell, Robert A. (1982) Ph.D., Harvard University, 1977. Second Language Acquisition, Computer-assisted Instruction, Natural Language Processing, Japanese.

Watabe, Masakazu (1977) Ph.D., University of Southern California, 1978. Linguistics, Japanese.

Williams, Gary S. (1966) Ph.D., University of Washington, 1973. Chinese Language and Literature.

Assistant Professor

Peterson, Mark A. (1983) Ph.D., Harvard University, 1987. Korean Language and History.

Graduate Program and Degree

Language Acquisition (Arabic, Chinese, Japanese, or Korean) (M.A.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Language Acquisition (Arabic, Chinese, Japanese, or Korean) (M.A.)

See preceding Language Acquisition section of this catalogue.

Asian and Near Eastern Graduate Courses

Chinese (Mandarin) Graduate Courses

599R. Cooperative Education: Internship. (9)

Prerequisite: Chin. 301.

On-the-job cultural and/or language experience.

670R. Tutorial Internship in Chinese. (1-3)

Individual research in cooperation with graduate faculty member in problems relating to Chinese literature and language. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in Chinese. (1-3)

Individual study supervised by graduate faculty member in varying topics of specific interest in Chinese literature and language.

690R. Seminar in Chinese. (1-3)

Group studies supervised by graduate faculty member in varying topics of specific interest in Chinese literature and language.

699R. Master's Thesis. (1-6)**Japanese Graduate Courses****599R. Cooperative Education: Internship.** (9)

Prerequisite: Japan. 301.

On-the-job cultural and/or language experience.

670R. Tutorial Internship in Japanese. (1-3)

Individual research in cooperation with graduate faculty member in problems relating to Japanese literature and language. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in Japanese. (1-3)

Individual study supervised by graduate faculty member in varying topics of specific interest in Japanese literature and language.

690R. Seminar in Japanese. (1-3)

Group studies supervised by graduate faculty member in varying topics of specific interest in Japanese literature and language.

699R. Master's Thesis. (1-6)**Korean Graduate Courses****599R. Cooperative Education: Internship.** (9)

Prerequisite: consent of coordinator and department.

On-the-job cultural and/or language experience. Students must meet departmental requirements and consult coordinator before enrollment. Report required.

670R. Tutorial Internship in Korean. (1-3)

Individual research in cooperation with graduate faculty member in problems relating to Korean literature and language. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in Korean. (1-3)

Individual study supervised by graduate faculty member in varying topics of specific interest in Korean literature and language.

690R. Seminar in Korean. (1-3)

Group studies supervised by graduate faculty member in varying topics of specific interest in Korean literature and language.

699R. Master's Thesis. (1-6)**Near Eastern Languages and Literature**

Ancient: Akkadian, Aramaic, Coptic, Egyptian, Hittite, Sumerian, Syriac, and Ugaritic Courses

511R. Studies in Ancient Near Eastern Languages. (2-4) On dem.

Grammar and reading skills.

521R. Special Topics in Ancient Near Eastern Literature. (2-3) On dem.

Historical and comparative studies of ancient Near Eastern literature.

Arabic Graduate Courses**531R. Advanced Topics in Arabic.** (3) On dem.

Prerequisite: consent of instructor.

Advanced studies in Arabic language and literature.

670R. Tutorial Internship in Arabic. (1-3) On dem.

Individual research in cooperation with graduate faculty member in problems relating to Arabic literature and language. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in Arabic. (1-3) On dem.

Individual study supervised by graduate faculty member in varying topics of specific interest in Arabic literature and language.

690R. Seminar in Arabic. (1-3) On dem.

Group studies supervised by graduate faculty member in varying topics of specific interest in Arabic literature and language.

699R. Master's Thesis. (1-6) On dem.**Hebrew Graduate Courses****531R. Studies in Hebrew.** (3V)

Prerequisite: Heb. 331.

French and Italian

Chair: Madison U. Sowell, 4002 JKHB, 378-2542.

The Department of French and Italian is not currently participating in the college-wide Graduate Program in Language Acquisition.

Germanic and Slavic Languages

Chair: Garold N. Davis, 4096 JKHB, 378-4924

Graduate Coordinator: Scott Abbott, 4086 JKHB, 378-3207

Faculty/Specialties**Professors**

Browning, Gary L. (1974) Ph.D., Harvard University, 1974. Russian Literature (Nineteenth- and Twentieth-Century Writers).

Davis, Garold Neil (1968) Ph.D., Johns Hopkins University, 1962. German Literature (Romanticism, Realism, *Heimatsdichtung*, Goethe's *Faust*).

Folsom, Marvin H. (1961) Ph.D., Cornell University, 1961. German Language, Structure of Modern German, History of German Language, Biblical German.

Jarvis, Donald K. (1970) Ph.D., Ohio State University, 1970. Russian Language (Pedagogy, Testing).

Jones, Randall L. (1978) Ph.D., Princeton University, 1970. German Language (Technology and Second-Language Acquisition, Testing), Pedagogy.

- Keele, Alan F. (1971) Ph.D., Princeton University, 1971.
German Literature (Earlier Twentieth Century, 1945–Present).
- Kelling, Hans-Wilhelm (1962) Ph.D., Stanford University, 1967. German Literature (*Goethezeit*), Cultural History, Pedagogy.
- Plummer, Thomas G. (1985) Ph.D., Harvard University, 1972. German Literature (Weimar Period), German Film.
- Rogers, Thomas F. (1969) Ph.D., Georgetown University, 1968. Russian Literature (Twentieth-Century Drama), Film.

Associate Professors

- Abbott, Scott (1988) Ph.D., Princeton University, 1979.
German Literature (Eighteenth, Nineteenth, Twentieth Centuries) and Literary Theory.
- Baker, Joseph O. (1967) Ph.D., Tulane University, 1968.
German Literature (Kleist, Realism).
- Hart, David Kay (1984) Ph.D., University of Washington, 1979. Russian Language (Phonology, Morphology, Syntax).
- Swanson, Alan M. (1982) Ph.D., University of Chicago, 1973. Scandinavian and Comparative Literature (Swedish, Eighteenth-Century Comedy), Scandinavian Emigration Literature, Hymnody.

Assistant Professors

- Davis, William Stephen (1989) Ph.D., Stanford University, 1989. Goethe, Eighteenth Century, Lyric, Literary Theory.
- Lund, Randall J. (1988) Ph.D., University of Minnesota, 1986. Foreign Language Methodology, Teacher Education, Second Language Acquisition.
- Stott, Michelle (1988) Ph.D., University of Utah, 1987.
Lessing, Kierkegaard, Eighteenth Century, Women's Studies.

Graduate Programs and Degrees

German Literature (M.A.)
Language Acquisition (German, Russian, or Scandinavian) (M.A.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

German Literature (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: April 1 for fall semester (May 1 for admission only; no financial aid or teaching assistantships considered); August 1 for winter semester (September 1 for admission only; no financial aid or teaching assistantships considered).
 - B. Entrance examination: GRE (GEN: Q, V, A).

II. Prerequisite:

- A. Baccalaureate degree in German or in a related field such as English, comparative literature, humanities, etc. Minor deficiencies in German linguistics, culture, or other background areas may be made up by enrolling in appropriate undergraduate courses.
- B. German language proficiency in all four skills at the advanced level as defined by the American Council on Teaching of Foreign Languages (ACTFL)—equivalent to the Interagency Language Roundtable (ILR) level 2.

III. Entry times: Fall and winter semesters.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Germ. 699R).
- II. Required courses:
 - A. CLit. 610, 3 hours.
 - B. 3 hours from CLit. 620R, 630R, 640R, 650R, 660R (should be a German-related topic; see graduate advisor before registering).
 - C. 18 hours of German graduate courses.
 - D. 6 hours of Germ. 699R (thesis).
- III. A reading knowledge of a second foreign language (fourth semester or equivalent).
- IV. Examination: Oral examination on reading list (see graduate advisor), course work, and thesis.

Language Acquisition (M.A.) (German, Russian, Scandinavian)

See preceding Language Acquisition section of this catalogue.

German Graduate Courses

615. Applied German Linguistics. (3) On dem.

Prerequisite: Germ. 360 and 450 or equivalent.

Applying linguistics to the problems of teaching German grammar.

640R. German Literary Periods and Movements. (3)

In-depth study of a period or movement such as medieval, Renaissance, baroque, eighteenth century, Romanticism, realism, fin-de-siècle Vienna, naturalism, 1890–1945, 1945–present.

641R. Studies in German Literary Genres. (3)

In-depth study of a genre such as drama, novel, novella, lyric, film.

642R. Major German Authors. (3)

In-depth study of one author such as Lessing, Goethe, Schiller, Kleist, Storm, Rilke, Brecht, Mann, Kafka, Hofmannsthal, etc.

670R. Tutorial Internship in German. (1–3)

Individual research in cooperation with graduate faculty member in problems relating to German. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in German. (1–3)

Individual study supervised by graduate faculty member in varying topics of specific interest in German.

690R. Seminar in German. (1-3)

Group studies supervised by graduate faculty member in varying topics of specific interest in German.

699R. Master's Thesis. (1-6)

Russian Graduate Courses

670R. Tutorial Internship in Russian. (1-3)

Individual research in cooperation with graduate faculty member in problems relating to Russian. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in Russian. (1-3)

Individual study supervised by graduate faculty member in varying topics of specific interest in Russian.

690R. Seminar in Russian. (1-3)

Group studies supervised by graduate faculty member in varying topics of specific interest in Russian.

699R. Master's Thesis. (1-6)

Scandinavian Studies Graduate Courses

529. Old Norse—Icelandic. (4)

Recommended: knowledge of a modern Scandinavian language.

670R. Tutorial Internship in Scandinavian. (1-3)

Individual research in cooperation with graduate faculty member in problems relating to Scandinavian. Tutorial work in writing research papers. Topics vary according to interests and expertise of faculty supervisor.

680R. Special Studies in Scandinavian. (1-3)

Individual study supervised by graduate faculty member in varying topics of specific interest in Scandinavian.

690R. Seminar in Scandinavian. (1-3)

Group studies supervised by graduate faculty member in varying topics of specific interest in Scandinavian.

699R. Master's Thesis. (1-6)

Spanish and Portuguese

Chair: Merlin H. Forster, 4048 JKHB, 378-2837

Graduate Coordinator: Peter P. Ashworth, 4024 JKHB, 378-3107

Faculty/Specialties

Professors

Cluff, Russell M. (1983) Ph.D., University of Illinois, 1978. Spanish-American Literature.

Forster, Merlin H. (1987) Ph.D., University of Illinois, 1960. Spanish-American Literature.

Larson, Jerry W. (1980) Ph.D., University of Minnesota, Minneapolis, 1977. Spanish Language Acquisition, Methodology, Media Specialist, Language Laboratories.

Lyon, Thomas E. (Ted) (1972) Ph.D., University of California, Los Angeles, 1967. Spanish-American Literature.

Moon, H. Kay (1963) Ph.D., Syracuse University, 1963. Spanish Literature.

Quackenbush, L. Howard (1970) Ph.D., University of Illinois, 1970. Spanish-American Literature.

Associate Professors

Ashworth, Peter P. (1966) Ph.D., University of Oklahoma, 1967. Spanish Literature.

Clegg, J. Halvor (1972) Ph.D., University of Texas, Austin, 1969. Phonology, Spanish Language, Linguistics.

Fails, Willis C. (1981) Ph.D., University of Texas, Austin, 1984. Spanish and Portuguese Linguistics.

Meredith, Robert Alan (1977) Ph.D., Ohio State University, Columbus, 1976. Spanish Language, Teaching Methodology.

Rosenberg, John R. (1985) Ph.D., Cornell University, 1985. Contemporary Peninsular Literature.

Assistant Professor

Labrum, Marian B. (1974) Ph.D., Middlebury College, 1988. Spanish-American Literature, Translation.

Graduate Programs and Degrees

Portuguese Language (M.A.)

Portuguese Literature (M.A.)

Spanish Language (M.A.)

Spanish Literature (M.A.)

Spanish Teaching (M.A.)

Language Acquisition (Spanish and Portuguese) (M.A.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Portuguese Language (M.A.)

Portuguese Literature (M.A.)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Prerequisite:
 - A. Baccalaureate degree in Portuguese or equivalent.
 - B. Reading knowledge of at least one other foreign language.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (699R).
- II. Thesis.
- III. Examination: Oral defense of thesis.

Spanish Language (M.A.)

Spanish Literature (M.A.)

Spanish Teaching (M.A.)

Admission and Entry

- I. Deadlines: University deadlines apply.
- II. Prerequisite:
 - A. Baccalaureate degree in Spanish or equivalent.
 - B. Reading knowledge of at least one other foreign language.
- III. Entrance examination: Applicants may be required to have an oral interview or produce a tape to demonstrate language proficiency.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (699R).

- II. Required courses: Span. 601, 699R; three courses outside specialization (at least one from each of the other two areas of specialization).
- III. Three writing options: thesis, two-paper option, or project, all written in M.L.A. style.
- IV. Examinations: Comprehensive written examination as well as a comprehensive oral examination over course work, reading list, and student's writing project.

Language Acquisition (Spanish and Portuguese) (M.A.)

See preceding Language Acquisition section of this catalogue.

Portuguese Graduate Courses

- 520R. Advanced Portuguese Grammar.** (3)
- 521. Romance Philology.** (3)
- 522. History of the Portuguese Language.** (2)
- 529. Special Topics in Portuguese Linguistics.** (3)
Topics from semantics to dialectology to sociolinguistics.
- 539R. Luso-Brazilian Theatre Production.** (3)
Theory and practice of dramatic performance. Includes participation in a play to be performed during the semester. Total 539R credit toward any degree may not exceed 3 hours.
- 542. Camões.** (3)
- 549R. Special Topics in Portuguese Literature.** (3)
- 552. Machado de Assis.** (2)
Prerequisite: Port. 441, 451, or equivalent.
- 553. Twentieth-Century Brazilian Literature.** (3)
Prerequisite: Port. 441, 451, or equivalent.
- 559R. Special Topics in Brazilian Literature.** (3)
- 580R. Directed Research in Portuguese.** (3)
Under direction of a faculty member, student designs and conducts research project that covers material not normally presented in regular course work. Research paper required. Total 580R credit toward any degree may not exceed 3 hours.
- 599R. Cooperative Education: Portuguese Internship.** (1-3)
Prerequisite: Port. 321 and consent of instructor.
For supervised internship credit on BYU Study Abroad programs only.
- 601A. Portuguese Linguistics and Research Methodology.** (3)
- 601B. Portuguese Literary Theory and Research Methodology.**
- 629R. Seminar in Portuguese Linguistics.** (3)
- 649R. Seminar in Portuguese Literature.** (3)
- 659R. Seminar in Brazilian Literature.** (3)
- 698R. Master's Project.** (1-6)
- 699R. Master's Thesis.** (1-9)

Spanish Graduate Courses

- 520. Advanced Spanish Grammar.** (3)
Application of contemporary grammatical concepts to problems in Spanish grammar.
- 521. Romance Philology.** (3)
Comparative study of evolution of Latin into modern Romance languages. Cross-listed with Latin 621 and Port. 521.
- 522. History of the Spanish Language.** (3)
Linguistic sources that contributed to formation of the Spanish language.
- 527. Translation and Interpretation 1.** (3) Prerequisite: Span. 428.
Translation of texts in specific fields. Simultaneous interpretation.
- 528. Translation and Interpretation 2.** (3) Prerequisite: Span. 527.
Individual translation and/or interpretation projects.
- 539R. Hispanic Theatre Production.** (3)
Prerequisite: consent of director.
Theory and practice of dramatic performance. Includes participation in play to be performed during semester. Total 539R credit toward any degree may not exceed 3 hours.
- 540. Medieval Spanish Literature.** (3)
Prerequisite: Span. 441 or equivalent.
Spanish Literature from *El Cantar de Mio Cid* (1140) through *La Celestina* (1499).
- 543. Golden Age Literature.** (3)
Prerequisite: Span. 441 or equivalent.
Sixteenth- and seventeenth-century Spanish literature.
- 544. Don Quijote.** (3)
Prerequisite: Span. 441 or equivalent.
In-depth study of Cervantes's *El ingenioso hidalgo don Quijote de la Mancha*.
- 546. Nineteenth-Century Spanish Literature.** (3)
Prerequisite: Span. 441 or equivalent.
Romanticism (1770s through 1870s) or the novels of Benito Perez Galdos and his contemporaries.
- 548. Twentieth-Century Spanish Literature.** (3)
Prerequisite: Span. 441 or equivalent.
Genre (twentieth-century novel, drama, or poetry) or particular school (Generation of 1898), Generation of 1927, etc.)
- 549R. Special Topics in Spanish Literature.** (3)
Prerequisite: Span. 441 or equivalent.
Specific topics in Spanish (peninsular) literature. Course content will vary each semester to offer optimum exposure to all areas of Spanish literature.
- 550. Pre-Columbian and Colonial Literature.** (3)
Prerequisite: Span. 451 or equivalent.
Indigenous literature (Maya, Nahuatl, etc.) and other texts written in Spanish colonial America through eighteenth century.

554. The Spanish American Novel. (3)

Prerequisite: Span. 451 or equivalent.

Selected Spanish-American novelists such as Juan Rulfo, Gabriel García Márquez, Alejo Carpentier, Mario Vargas Llosa, etc.

555. Spanish American Poetry. (3)

Prerequisite: Span. 451 or equivalent.

Selected Spanish-American poets, movements, and national traditions.

556. Latin American Drama. (3)

Prerequisite: Span. 451 or equivalent.

Twentieth-century theatre from Spanish America and Brazil.

558. Hispanic American Short Story. (3)

Prerequisite: Span. 451 or equivalent.

Introduction and development of an important literary genre in Spanish America, including works of Jorge Luis Borges, Julio Cortázar, Juan Rulfo, Gabriel García Márquez, etc.

559R. Special Topics in Spanish-American Literature. (3)

Prerequisite: Span. 451 or equivalent.

Specific topics in Latin American literature. Course content will vary each semester to offer optimum exposure to all areas of Latin American literature.

577. Spanish Language Teaching Procedures. (3)

For public school teachers. Mastery of teaching skills specific to foreign language instruction. Lectures, demonstrations, practical experience.

580R. Directed Research in Spanish. (3)

Prerequisite: written proposal subject to department approval.

Individualized study. Under direction of a faculty member, student designs and conducts research project that covers material not normally presented in regular course work. Research paper required. Total 580R credit toward any degree may not exceed 3 hours.

599R. Cooperative Education: Spanish Internship. (1-3)

Prerequisite: Span. 321 and consent of instructor.

For supervised internship credit on BYU Study Abroad programs only.

601A. Hispanic Linguistics and Research Methodology. (3)

Basic research fields in linguistics (i.e., phonology, philology, syntax, psycholinguistics), how research differs in each area, and specific theoretical issues associated with each. Bibliographical and field research methods and techniques of reporting findings.

601B. Hispanic Literary Theory and Research Methodology. (3)

Introduction to literary theory, beginning with Aristotle's *Poetics* and continuing to present, but emphasizing major schools of literary theory in twentieth century. Bibliographical techniques and formats for critical essays.

601C. Research Designs in Hispanic Language Teaching. (3)

Designing and evaluating empirical research studies in foreign language learning and teaching methodology. Bibliographical techniques and methods of reporting findings.

622. Hispanic Dialectology. (3)

625. Spanish Morphosyntax. (3)

Linguistic study of morphological and syntactic structure of Spanish.

626. Spanish Phonetics and Phonology. (3)

Prerequisite: Span. 326 or consent of instructor.

Systematic study of articulatory and acoustic Spanish phonetics and of structural and generative approaches to phonological description of Spanish.

629R. Seminar in Spanish Linguistics. (3)

649R. Seminar in Spanish Literature. (3)

659R. Seminar in Spanish-American Literature. (3)

671. Principles of Foreign Language Learning and Teaching. (3)

Core course work for all M.A. candidates. Basic theories and principles of language learning and teaching. History, current research, practices, trends, and issues.

672. Media and Technology in Foreign Language Instruction. (3)

Applying modern technology and instructional media in teaching foreign languages.

673R. Directed Teaching of Spanish. (1-3)

Prerequisite: Span. 326, 377, and graduate assistantship in department.

Supervised, practical experience in teaching Spanish at the college level.

674. Teaching Hispanic Culture. (3)

Methods of researching and teaching Hispanic culture.

676. Principles of Testing Foreign Language Skills. (3)

Test development and analysis for assessment of the four skills plus grammar and culture; survey and questionnaire construction.

678. Research Design in Foreign Language Instruction. (3)

Designing and evaluating empirical research studies in foreign language learning and teaching methodology.

679R. Seminar in Teaching Spanish. (3)

For experienced language teachers.

698R. Master's Project. (1-6)

Prerequisite: consent of advisory chair.

Candidates in nonthesis program may complete approved field project as their writing/research experience.

699R. Master's Thesis. (1-9)

J. Reuben Clark Law School

Faculty/Specialties

Professors

Backman, James H. (1973) J.D., University of Utah, 1972.

Banking Law, Consumer Law, Land Use Planning, Real Estate Transactions, Real Property.

Davis, Ray Jay (1981) J.D., Harvard University, 1953. Torts, Water Rights, Workers' Compensation.

- Durham, W. Cole, Jr. (1976) J.D., Harvard University, 1975. Comparative Law, Constitutional Law, Criminal Law, Jurisprudence.
- Farmer, Larry C. (1977) Ph.D., Brigham Young University, 1975. Computer-based Expert Systems in Law Practice, Law and Behavioral Science, Law and Psychiatry, Legal Interviewing and Counseling, Negotiation.
- Fleming, J. Clifton, Jr., Associate Dean (1974) J.D., George Washington University, 1967. Business Planning, Corporate Finance, Estate Planning, Federal Taxation.
- Gedicks, Frederick M. (1990) J.D., University of Southern California, 1980. Business Associations, Law and Religion, Securities Regulation, Constitutional Law.
- Goldsmith, Michael (1985) J.D., Cornell University, 1975. Criminal Law, Criminal Procedure, Evidence, RICO.
- Gordon, James D., III (1984) J.D., University of California, Berkeley, 1980. Contracts, Securities Regulation.
- Hafen, Bruce C., Provost (1971) J.D., University of Utah, 1967. Constitutional Law, Education Law, Family Law.
- Hansen, H. Reese, Dean (1974) J.D., University of Utah, 1972. Director, Clinical Studies. Wills, Estates, and Trusts; Estate and Gift Tax.
- Hawkins, Carl S. (1973) J.D., Northwestern University, 1951. Civil Procedure, Federal Jurisdiction, Torts.
- Kimball, Edward L. (1973) S.J.D., University of Pennsylvania, 1962. Evidence, Criminal Justice Administration, Criminal Law, Criminal Trial Practice.
- Lee, Rex E., President (1971) J.D., University of Chicago, 1963. Antitrust, Appellate Advocacy, Constitutional Law.
- Lundberg, Constance K., Associate Dean (1982) J.D., University of Utah, 1972. Environmental Law, Federal Courts, Natural Resources, Interviewing and Counseling.
- Parker, Douglas H. (1975) J.D., University of Utah, 1952. Federal Indian Law, Jewish Law, Indian Law, Roman Law, Professional Responsibility.
- Riggs, Robert E. (1975) LL.B., University of Arizona, 1963. Constitutional Law, International Law, International Organizations, Supreme Court.
- Thomas, David A. (1974) J.D., Duke University, 1972. Federal Jurisdiction, Legal Bibliography, Legal History, Legal Research and Writing, Real Property.
- Wardle, Lynn D. (1978) J.D., Duke University, 1974. Biomedical Ethics and Law, Civil Procedure, Conflict of Laws, Family Law.
- Welch, John W. (1980) J.D., Duke University, 1975. Agency and Partnerships, Corporate Finance, Corporations, Federal Taxation.
- Williams, Gerald R. (1973) J.D., University of Utah, 1969. Contracts, Insurance, Law and Society, Office Practice, Remedies, Legal Negotiation and Settlement.
- Wilkins, Richard G. (1984) J.D., Brigham Young University, 1979. Antitrust, Civil Procedure, Federal Courts, Civil Rights.
- Wood, Stephen G. (1976) J.D., University of Utah, 1969; J.S.D., Columbia University, 1980. Administrative Law, Civil Rights, Collective Bargaining, Comparative Law, International Transactions, Labor Law.

Associate Professors

- Burns, Jean Wegman (1986) J.D., University of Chicago, 1973. Antitrust, Commercial Law, Conflicts of Laws.

- Dominguez, David (1989) J.D., University of California, Berkeley, 1980. Criminal Law, Negotiations, Labor Law.
- Preston, Cheryl Bailey (1989) J.D., Brigham Young University, 1979. Debtor-Creditor Rights, Gender and Law, Commercial Law, Lender Liability.
- Worthen, Kevin J. (1987) J.D., Brigham Young University, 1982. Torts, Environmental Law.

Graduate Programs and Degrees

Juris Doctorate (J.D.)

Master of Comparative Law (M.C.L.)

Students admitted to the highly competitive programs of the Law School receive a breadth and depth of training that prepares them to function in the wide range of activities that occupy the professional lawyer's life. Students gain firsthand experience with a variety of teaching and learning methods, among them Socratic or inductive teaching, problem solving, seminars, individual research, and clinical experience.

Admission

To be admitted to the Law School, an applicant must be a college graduate who has excelled academically and has scored in the upper range of the nationally administered Law School Admission Test. In addition, applicants must meet the general university admission requirements, including the personal standards required of all students.

The Law School selects approximately 150 students each year for admission to the new class. Admissions are for fall semester only.

Application deadline: February 15.

By the posted deadline, all parts of the completed application must have been received in the Graduate Admissions Office, B-356 ASB. To be considered complete, the application must include the following:

—A completed application on the official Law School application form.

—A check or money order for \$30 payable to Brigham Young University. This is nonrefundable and is not credited toward tuition.

—Three completed evaluations from undergraduate teachers on Prospective Law Student Evaluation Forms included in the official application.

—The report of the applicant's interview with an LDS bishop, branch president, or mission president; religious leader of another faith; or judge of a court of general jurisdiction indicating the applicant's willingness to comply with the BYU Code of Honor and standards of conduct.

For additional information about admissions requirements, criteria, notification, and procedures, including the LSAT and registration with the Law School Data Assembly Service (LSDAS), see the Law School Bulletin.

Besides the juris doctor degree, the university has approved programs whereby qualified students can obtain a concurrent master's degree in business administration, public administration, accounting, or organizational behavior while pursuing a law degree. These are four-year programs.

M.C.L. Program

The J. Reuben Clark Law School created the master of comparative law (M.C.L.) program in 1988 to provide an opportunity for lawyers trained in jurisdictions outside the United States to engage in a comparative study of the U.S. legal system with that of their home country. The program provides maximum exposure to the U.S. legal system and frequent interaction between master of comparative law students and students seeking the juris doctorate degree. Students obtain a solid foundation in the basic principles of United States law while being allowed the flexibility to pursue personal academic interests. To ensure a superior educational experience for students in the program, admission is limited to six to eight applicants per year.

Tuition, Fees, and Financial Aid

Tuition and fees must be paid before or at the time of registration. Since more than 50 percent of the cost of operating the Law School comes from the tithes of The Church of Jesus Christ of Latter-day Saints, students and the families of students who are tithe-paying members have already made a significant contribution to the university and are thus charged a lower tuition fee than nonmembers. This disparity is similar to the higher tuition charged by law schools of state universities to nonresidents.

Semester tuition:	\$1,890LDS
	\$2,835non-LDS

A number of scholarships and endowed awards are available to law students, as well as a variety of low-interest loans. Students interested in these opportunities should inquire at the Law School and the university's Financial Aid Office.

Law Courses

See the Law School Bulletin for course descriptions.

- 505 and 506. Torts 1 and 2. (3 ea.)
- 510 and 511. Contracts 1 and 2. (3 ea.)
- 515 and 516. Civil Procedure 1 and 2. (3 ea.)
- 520 and 521. Property 1 and 2. (3 ea.)
- 525. Criminal Law. (3)
- 535 and 536. Legal Research and Writing 1 and 2. (1.5 ea.)
- 601. Accounting for Lawyers. (3)
- 602. Administrative Law. (3)
- 603. Criminal Procedure. (3)
- 604. Advanced Legal Writing. (2)
- 605. Antitrust. (3)
- 606. Anglo-American Legal History. (2)
- 607. Biblical Law. (2)
- 608. Banking Law. (2)
- 610. Business Associations. (4)
- 611. Advising Closely Held Businesses. (2)

- 614. Combining and Reorganizing Corporate Businesses. (2)
- 615. Commercial Law 1. (3)
- 616. Commercial Law 2. (3)
- 617. Comparative Law. (3)
- 618. Community Property. (2)
- 619. Conflict of Laws. (2)
- 620. Constitutional Law 1. (3)
- 621. Constitutional Law 2. (3)
- 622. Civil Appellate Advocacy and Practice. (2)
- 623. Debtor and Creditor Rights. (4)
- 624. Environmental Law. (3)
- 625R. Evidence. (4)
- 627. Consumer Protection. (3)
- 628. Equitable Remedies. (3)
- 631. Tax Planning for Individuals. (3)
- 632. Family Law. (3)
- 633. Advanced Family Law. (2)
- 634. Law and Economics. (3)
- 635. Federal Courts. (3)
- 636. Government Contracts. (3)
- 638. Contemporary Legal Theory. (3)
- 639. International Business Transactions. (3)
- 640. Federal Taxation 1. (4)
- 641. Federal Taxation 2. (4)
- 642. Intellectual Property Law. (2)
- 644. Insurance Law. (3)
- 645. Federal Indian Law. (3)
- 646. Jurisprudence. (3)
- 647. International Organizations. (3)
- 648. Workers' Compensation. (2)
- 650. Real Estate Finance. (3)
- 652. Legislation. (2)
- 654. Legal History and Legal Thought. (3)
- 655. Labor Law. (3)
- 656. Public Land and Natural Resources. (3)
- 657. Fair Employment Practices and Standards. (3)
- 658. Land Use Planning. (3)
- 659. Public International Law. (3)
- 660. Professional Responsibility. (2)
- 662. Securities Regulation. (3)
- 663. State and Local Government 1. (3)
- 664. Taxation of Natural Resources. (3)

- 665. Trusts. (2)
- 666. Wills, Decedents' Estates, and Trusts. (4)
- 667. Roman Law. (2)
- 668. Legal Negotiation and Settlement. (3)
- 669. Public Employment Labor Relations. (2)
- 670. Advanced Real Estate Transactions. (2)
- 672. Securities Litigation. (2)
- 673. Minerals Development Law. (3)
- 674. Law Office Management. (2)
- 675. Advanced Torts. (2)
- 676. Personal Property Security. (3)
- 677. Regulated Industries. (3)
- 678. Perspectives on Gender and Law. (2)
- 680. State and Local Government 2. (3)
- 681. Tax Procedure. (2)
- 682. Trade Regulation. (2)
- 683. Jewish Law. (2)
- 684. Water Law. (3)
- 686R. Special Topics in Law. (2 ea.)
- 687R. Special Topics in Law. (1-4 ea.)
- 690R. Directed Research. (1-2 ea.)
- 691R. Directed Readings. (1-2 ea.)
- 692R. Cocurricular Programs. (1 ea.)
- 693R. Third-Year Cocurricular Writing (2 ea.)
- 695R. Law School Seminars. (Arr.)
- 696R. Law School Seminars. (Arr.)

School of Library and Information Sciences

Director: Nathan M. Smith, 5042 HBLL, 378-2976

Graduate Coordinator: Dorothy M. Shields, 5042 HBLL, 378-6686

Faculty/Specialties

Professors

- Marchant, Maurice P. (1969) Ph.D., University of Michigan, Ann Arbor, 1970. Administration, Research Methods.
- Smith, Nathan M. (1966) Ph.D., Brigham Young University, 1972. Interpersonal Relations, Reference, Research Methods.
- Wright, H. Curtis (1959) Ph.D., Case Western Reserve University, 1969. Philosophy of Librarianship, Communication Theory.

Associate Professors

- Shields, Dorothy M. (1974) Ed.D., Brigham Young University, 1977. Cataloguing, School Librarianship, Research.
- Stirling, Keith H. (1972) Ph.D., University of California, Berkeley, 1977. Information Systems Design, Research Methods.

Assistant Professors

- Broadway, Marsha D. (1985) Ph.D., Florida State University, 1985. Reference, Children's and Young Adult Literature.
- Purdy, Victor William (1954) M.S., Columbia University, 1957. Selection, Acquisitions, Operations Research.

Graduate Program and Degree

Library and Information Sciences (M.L.I.S.)

The master of library and information sciences degree program, accredited by the American Library Association and accepted throughout the U.S. and Canada, prepares students to enter librarianship at the professional level. Completion of the program can lead to work in libraries, media centers, and information systems of many kinds.

The curriculum normally consists of 23 hours of required courses, which include the basic courses and completion of a research project or thesis, and 15 hours of elective course work through which students can specialize. With faculty approval, students may elect courses offered by departments outside the school.

The school offers a limited number of financial awards, and many students work part-time in the library.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Library and Information Sciences (M.L.I.S.)

Admission and Entry

- I. Deadlines: May 1, fall; September 1, winter; February 6, spring; April 1, summer.
- II. Prerequisite: Baccalaureate degree in an academic program.

Requirements for Degree

- I. Credit hours (38): Minimum 38 course work hours (a minimum of one calendar year) including thesis or project.
- II. Required courses: LIS 513, 523, 527, 530, 536, 538, 596, and 696 or 697 or 699R (6 hours required of 699R).
- III. Electives: May be chosen from library and information sciences offerings or, with approval of faculty advisor, from other departments on campus, depending on student's personal objectives.
- IV. Attendance at colloquia.
- V. Research project or thesis.
- VI. Examination: Oral defense of thesis.

Program and Degree Resources

Special awards and scholarships: S. R. and Anita Shapiro Award, Hattie M. Knight Award and Scholarship, Best Research Project Report Award, Naoma Rich Earl Scholarship, and DYNIX, Inc. Scholarship.

Library and Information Sciences Graduate Courses

513. Selection and Acquisition of Materials. (3)

Theoretical and practical aspects of collection development, including selection and acquisition of print and non-print materials.

523. Reference Theory and Service. (3)

Reference theory, process, and services; basic reference sources; library users' needs and habits; information transfer models.

527. Basic Cataloguing and Classification. (3)

Survey course in cataloguing principles. Descriptive cataloguing, emphasizing AACR2 rules. Introduction to Dewey Decimal Classification, Sears Subject Headings, and MARC format. Lab fee.

530. Philosophical Bases of Librarianship. (2)

Epistemological, historical, professional, and philosophical bases of library and information sciences.

536. Library Organization and Administration. (3)

Organizational and administrative theory and problems associated with personnel, authority, policy, planning, reports, standards, etc.

538. Documentation and Information Retrieval. (3)

Design and evaluation of automated literature-searching systems. Recent developments in on-line bibliographic retrieval. Developing and using search strategies on commercial on-line data bases.

549. Literature of Mormonism. (3)

Church's communication structure, serial publications, reference sources. Individualized study of factual/creative works in print/nonprint formats ranging over all aspects of Mormonism.

557. The Library Media Center in the School. (3)

Problem-oriented approach examining role of librarian/media specialist in public education. Budget preparation, policy writing, and various individualized problems.

558. Library Services for Children and Young Adults. (3)

Programs and services designed to meet needs of individuals and groups of young people. Current issues. Public library emphasis.

565. Information Systems Analysis and Library Automation. (3)

Systems analysis and data processing techniques applied to library technical processing. Design specifications for user-friendly systems. Project required.

571. Archives and Manuscripts. (3)

Introduction to archival history and theory in Western civilization, emphasizing U.S. archival practices, including appraisal, acquisitions, preservation, processing, dissemination, and research use.

575. Preservation of Library and Archival Materials. (3)

Causes of material deterioration and compensating methods.

580R. Workshop: Current and Special Problems. (1-2)

582. Librarian Interpersonal Relations. (3)

Models by Adler, Ellis, and Berne related to librarian's personal interactions. Assertiveness training. Conflict resolution.

594R. Special Topics in Library Science. (1-3)

Topics vary.

596. Evaluating and Using Library Research. (3) F, W, Alt. term

Problem identification, applicable social science research methods, and basic statistical interpretations. Writing a research proposal. Interpreting and critiquing library-related research. Lab.

599R. Cooperative Education in Librarianship. (Arr.)

Prerequisite: consent of instructor.

Practical on-the-job experience and training in library and information services. Practicum; internship. Report required.

623. Advanced Reference Services and Resources. (3)

Prerequisite: LIS 523.

Managing and evaluating reference staff and resources, planning and implementing library use instruction, and investigating reference sources in a subject area.

624. Government Publications. (3)

Intensive study of documents published by federal, state, and local governments and the U.N., emphasizing selection, organization, and use in different types of libraries.

627. Advanced Cataloguing and Classification. (3)

Prerequisite: LIS 527.

Problems in classification, descriptive cataloguing, and subject headings. Library of Congress emphasized. Comparisons and study questions included. Cataloguing of serials. Machine-readable cataloguing (MARC). Lab fee.

629. Classification Theory. (3)

Philosophical and theoretical bases of classification and cataloguing.

630. The Intellectual Foundation of Library History. (3)

Traces cultural tension between Greco-Roman naturalism and Judeo-Christian supernaturalism through main watersheds of Western thought. Follows its expression in art, literature, and philosophy.

633. History and Theory of Manuscript and Printing. (3)

Development of communications and librarianship from the pre-writing period to early printing.

638. Advanced Information Science. (3)

Prerequisite: LIS 538.

Formal methods of intellectual access to documents. Content analysis of on-line data bases. Bibliographic forms for transmitting meaning. Search strategies. Lab fee.

671. The Public Library in Society. (3)

History, purposes, and functions of American public libraries. Standards, guidelines, community analysis, budgeting, and evaluation.

672. Libraries in Higher Education. (3)

History, roles, and functions of the library as a component of institutions of higher learning. Standards, guidelines, budgeting, and evaluation.

694R. Independent Research. (1-2)

696. Library Operations Research. (3)

Prerequisite: LIS 596.

Participation in operations or other types of research individually or as team member in area of instructor's

specialization. Analyzing and presenting results for peer critique.

697. Research Project Seminar. (3)

Prerequisite: LIS 596.

Researching library-related problems and presenting results at each stage. Critiquing all other students' papers; investigating research approaches and interpretations. Option to write in publication format.

699R. Master's Thesis. (1-6)

Prerequisite: LIS 596 or consent of instructor.

Linguistics

Chair: Melvin J. Luthy, 2129 JKHB, 378-2937

Graduate Coordinator: Charles Ray Graham, 3187 JKHB, 378-2208

Faculty/Specialties

Professors

- Blair, Robert W. (1959) Ph.D., Indiana University, Bloomington, 1964. SLA, Sociolinguistics and Methodology, Materials Development.
 Luthy, Melvin J. (1971) Ph.D., Indiana University, Bloomington, 1967. Phonology, Syntax, Finnish Studies.
 Otto, Frank R. (1975) Ph.D., University of Wisconsin, Madison, 1966. CAI, Materials Development, Program Supervision, TESL.
 Robertson, John S. (1977) Ph.D., Harvard University, 1976. Mayan Linguistics, Semiotics, Semantics, Comparative Historical Linguistics.

Associate Professors

- Brown, Cheryl (1975) Ph.D., University of California, Los Angeles, 1983. SLA, Discourse, Methodology, Research Design, TESL.
 Graham, Charles Ray (1980) Ph.D., University of Texas, Austin, 1977. SLA/Attrition, ESL, Spanish.
 Melby, Alan K. (1977) Ph.D., Brigham Young University, 1976. Computer Aids for Translators, Syntax, French.

Assistant Professors

- Scott, Mary Lee (1990) Ph.D., University of California, Los Angeles, 1989. Applied Linguistics, Testing, Language Acquisition.
 Shelley, Monte F. (1976) Ph.D., University of California, Los Angeles, 1983. Text Retrieval and Analysis, Instructional Science and Instructional Evaluation.

The following are linguists in other departments who frequently teach linguistics courses in their own departments or in the Department of Linguistics and who also serve on graduate and other committees for the Linguistics Department.

- Brown, Bruce L. (Linguistics and Psychology)
 Bush, Charles (Computer Applications)
 Chi, T. Richard (Chinese)
 Clegg, J. Halvor (Spanish)
 Eggington, William (English)
 Fails, Willis C. (Spanish)
 Folsom, Marvin H. (German)
 Hart, David K. (Russian)
 Jarvis, Donald (Russian)
 Jones, Randall L. (German)

- Larson, Jerry (Spanish)
 Lund, Randall (German)
 Meredith, R. Alan (Spanish)
 Parkinson, Dilworth B., (Arabic)
 Russell, Robert A. (Japanese and Arabic)
 Skousen, Royal (English)
 Smith, Kim (Computer Applications)
 Watabe, Masakazu (Japanese)

The Linguistics Department is responsible for the following academic programs:

- Linguistics
- Teaching English as a Second Language
- American Indian Languages
- Central and South American Indian Languages
- Austronesian Languages
- Welsh
- American Sign Language

Graduate Programs and Degrees

- Linguistics (M.A.)
- TESL Certificate
- TESL (M.A.)

Areas of Emphasis

Language acquisition, computer applications, applied linguistics, TESL.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Linguistics (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. International applicants: Departmental English Proficiency Exam.
- II. Prerequisite:
 - A. 6 hours in upper-division linguistics.
 - B. High-level competency (321 level or higher) in one foreign language.
 - C. ESL 404 is required of all nonnative English speakers.
- III. Entry time: Fall semester recommended.

Requirements for Degree

- I. Credit hours (32): Minimum 26 course work hours plus 6 thesis hours (Ling. 699R).
- II. Required courses: Ling. 521, 540, 630, 690, 699R.
- III. Electives: 15 approved hours.
- IV. Thesis.
- V. Examinations (consult department for details):
 - A. Written comprehensive examination (on completion of course work).
 - B. Oral defense of thesis.

TESL Graduate Certificate

BYU's TESL certificate (not to be confused with state teacher certification) is designed to prepare teachers for overseas English programs as well as for stateside English assignments teaching foreign students.

Admission and Entry**I. Application requirements:**

- A. Deadlines: University deadlines apply.
- B. Entrance examinations for nonnative speakers of English: TOEFL, minimum score 550; Departmental English Proficiency Exam. Any deficiencies in English skills must be remedied to the satisfaction of the department before moving into the TESL program.

II. Prerequisite:

- A. Intermediate-level proficiency in a modern foreign language. (Language courses may be taken concurrently with ESL graduate courses.)
- B. Ling. 230.
- C. ESL 404 is prerequisite for all nonnative English speakers. Both Ling. 230 and ESL 404 should be completed before or during the first semester of course work.

III. Entry time: Fall semester recommended.**Requirements for Certificate**

- I. Credit hours (18): Minimum 18 course work hours.
- II. Required courses: Ling. 577, 579.
- III. Electives: 12 hours from Ling. 500, 525, 531, 540, 555, 565R, 571, 572, 573, 641, 660, 677, 678.

The graduate TESL program has been accepted by the Utah Board of education as an accredited teaching major for secondary education students. Those who have completed student teaching in an area other than ESL are still required to complete 2 hours of student teaching in English as Second Language (Ling. 579).

TESL (M.A.)**Admission and Entry****I. Application requirements:**

- A. Deadlines: University deadlines apply.
- B. Applicants must petition the department and be accepted by a review board. Students should not register for 600-level course work until notified of acceptance into the M.A. program.

II. Prerequisite:

- A. Completion of graduate TESL Certificate.
- B. Ling. 500 and acceptance of thesis prospectus.
- C. Evidence of graduate-level writing skills.

III. Entry time: Fall semester recommended.**Requirements for Degree**

- I. Credit hours (37): Minimum 31 hours (including 18 hours from TESL Certificate) plus 6 thesis hours (Ling. 699R).
- II. Required courses: Ling. 540, 600, 695.
- III. Electives: 6 hours chosen from the following: Ling. 520, 521, 525, Engl. 529, Ling. 531, 535, 550, 551, 555, 565R, 571, 572, 573, 600, 641, 671, 677, 678, 679.
- IV. Thesis.
- V. Final oral examination: defense of thesis and examination of course work.

Linguistics Graduate Courses**500. Bibliography and Research. (1)**

Procedures for developing research projects and reporting on their results; priority given to major papers and M.A. thesis projects.

520. Phonetics. (3)

Prerequisite: Ling. 330.

General inventory of speech sounds possible in language, from both an acoustic and articulatory point of view.

521. Phonology. (3)

Prerequisite: Ling. 330.

Discriminative values of speech sounds: their function in the communicative process. Analysis of phonological data via postulation of underlying forms and derivational rules.

525. Phonology of Modern English. (3)

Prerequisite: Engl. 328 or Ling. 330 or equivalent.

Articulatory phonetics (phonemics), intonation, and contrastive analysis of English sounds with those of other languages. Strong practicum included.

531. Grammar Usage. (3)

Examining English grammar and usage as they reflect different theories about language description and applying this knowledge in the ESL classroom.

535. Semantics. (3)

Prerequisite: Ling. 330.

Theory and practice of semantic analysis with special emphasis on Jakobsonian and Peircean semiotics.

540. Language Acquisition. (3)

Prerequisite: Ling. 330 or equivalent.

First- and second-language acquisition viewed in light of psycholinguistics and sociolinguistics.

550. Sociolinguistics. (3)

Research and theory in anthropological linguistics and sociolinguistics.

551. Anthropological Linguistics. (3)

Language in culture and society: development, typology, and description.

555. Teaching Culture. (3)

Experience developing materials and activities dealing with typical patterns of U.S. life-style. Variety of readings.

565R. Humanities Computing Project. (1-3)

Prerequisite: consent of instructor.

Major application or research project, working with instructor to do ongoing research or program development.

571. English as a Second Language in the Elementary School. (3) On dem.

Nature of language acquisition and strategies and materials designed to facilitate second language learning in the primary grades.

572. TESL Reading-Writing. (3)

Basic techniques for teaching ESL skills in reading and writing; applying these skills in the classroom.

573. TESL Literature. (3) On dem.

Teaching literature to nonnative English speakers, both TEFL and TESL.

577. Introduction to ESL Methodology. (4)

Prerequisite: ESL 404 or being native English speaker.

Instruction in basic second language methodology, ESL teaching techniques, and materials selection. Actual ESL class observation and practice.

579. TESL Student Teaching. (2)

Prerequisite: Ling. 577 and advance departmental approval.

580R. Problems in Linguistics and Applied Linguistics. (1-3V) On dem.

Advanced research in language acquisition, sociolinguistics, psycholinguistics, linguistics field study, applied linguistics.

590R. Readings in Linguistics. (1-3)

Prerequisite: consent of instructor.

Individual study of current linguistic literature. Occasional discussion sessions with instructor and other class members. Pass-fail grade only.

599R. Cooperative Education. (1-9) On dem.

On-the-job experience under faculty supervision.

600. Research Design and Bibliography. (3)

Prerequisite: Ling. 500.

Analysis of the options in research design for examining language teaching and acquisition; basic statistics; use of computers in language research.

630. Syntactic Theory. (3)

Prerequisite: Ling. 430 or equivalent.

Theory of transformational grammar, emphasizing its history and recent extensions.

641. Interlanguage Analysis. (3)

Prerequisite: Ling. 330 or equivalent.

Language as it relates to language acquisition and teaching, including contrastive analysis, error analysis, and discourse analysis.

660. Language Testing. (3)

Construction, analysis, use, and interpretation of language tests.

671. TESL Supervision-Administration. (2)

Prerequisite: Ling. 579 or equivalent.

Ministerial language policies, teacher selection and preparation, program development and direction.

677. Advanced Methodology. (3)

Prerequisite: Ling. 577 or equivalent.

Advanced ESL methodology and its classroom application.

678. Materials Development. (3)

Prerequisite: Ling. 577.

Computer-assisted language materials development; evaluating and adapting texts, exercises, games, and supplementary teaching aids; developing tapes.

679. TESL Supervision-Administration Internship. (2)

Prerequisite: Ling. 671 or consent of instructor.

Actual fieldwork in TESL settings involving supervision, in-service training, and curricula-program study and administration.

690. Seminar in Linguistics. (2)

Prerequisite: Ling. 630.

Advanced research and analysis of various linguistic problems.

695. TESL Seminar. (1) Prerequisite: completion of majority of ESL courses; consent of instructor.

Integrating TESL theory and practice; refining thesis and publicly presenting and defending preliminary thesis.

699R. Master's Thesis. (1-9)

Management

J. Willard and Alice S. Marriott School of Management

The J. Willard and Alice S. Marriott School of Management is composed of the Graduate School of Management and the College of Business.

The Graduate School of Management publishes its own bulletin describing programs in detail. Prospective applicants should write directly to the dean's office to obtain a copy. Consult the Graduate School of Management Bulletin for tuition, application deadlines, and financial aid information.

The College of Business administers the Managerial Economics Program. Interested persons should direct inquiries to Managerial Economics, 610 TNRB, 378-2364, for further information.

School of Accountancy and Information Systems

School of Accountancy Director: W. Steve Albrecht, 540 TNRB, 378-3154

Associate Director: Ernest Dee Hubbard, 560 TNRB, 378-3268

Faculty/Specialties

Professors

Albrecht, W. Steve (1977) Ph.D., University of Wisconsin, 1975. Financial/Audit Systems.

Cameron, James B. (1969) Ph.D., Montana State University, 1967. Financial/Audit Systems.

Carlson, Gary (1986) Ph.D., University of California, Los Angeles, 1962. Information Systems.

Cherrington, Jay Owen (1978) Ph.D., University of Minnesota, Minneapolis, 1972. Financial Systems.

Gardner, Robert L. (1978) Ph.D., University of Texas, Austin, 1979. Tax.

Garrison, Ray H. (1966) D.B.A., Indiana University, Bloomington, 1966. Managerial Accounting.

Hansen, James V. (1982) Ph.D., University of Washington, 1973. Information Systems.

- Hardy, John W. (1969) Ph.D., University of Texas, Austin, 1972. Managerial Accounting.
- Hubbard, Ernest Dee (1959) Ph.D., University of Washington, 1967. Managerial Accounting.
- McKell, Lynn J. (1974) Ph.D., Purdue University, 1973. Information Systems.
- Radebaugh, Lee Howard (1980) D.B.A., Indiana University, Bloomington, 1973. International Business.
- Randall, Boyd C. (1974) Ph.D., University of Minnesota, 1972. Tax.
- Romney, Marshall B. (1977) Ph.D., University of Texas, Austin, 1977. Audit/Systems Accounting.
- Skousen, K. Fred, Dean (1970) Ph.D., University of Illinois, 1968. Financial Accounting.
- Smith, Harold T. (1963) Ed.D., Brigham Young University, 1967. Information Systems.
- Smith, Jay M., Jr. (1971) Ph.D., Stanford University, 1965. Financial/Audit Systems.
- Stewart, Dave Nelson (1980) Ph.D., University of Florida, 1980. Tax.
- Streuling, G. Fred (1976) Ph.D., University of Iowa, 1971. Tax.
- Taylor, Dale H. (1963) Ph.D., Northwestern University, 1963. Financial Accounting.
- Woodfield, Leon W. (1960) D.B.A., Michigan State University, 1965. Financial Accounting.

Associate Professors

- Boyer, Glen L. (1967) Ph.D., University of North Dakota, 1972. Information Systems.
- Hansen, Gary W. (1983) Ph.D., Indiana University, 1974. Information Systems.
- Howe, Keith R. (1979) D.B.A., Arizona State University, 1979. Managerial Accounting.
- McAllister, LeRay L. (1963) D.B.A., Arizona State University, 1971. Financial/Audit/Not-for-Profit Accounting.
- McClurg, Lynn E. (1983) Ed.D., Brigham Young University, 1978. Information Systems.
- Sonderregger, Emory O. (1960) M.S., Brigham Young University, 1957. Financial Accounting.
- Stocks, Kevin D. (1983) Ph.D., Oklahoma State University, 1981. Managerial Accounting, Information Systems.
- White, J. Morgan (1967) M.S., Brigham Young University, 1958. Tax.

Assistant Professors

- Dalebout, Richard S. (1975) S.J.D., University of Utah, 1971. Business Law.
- Denna, Eric L. (1988) Ph.D., Michigan State University, 1989. Information Systems.
- Deppe, Larry A. (1988) Ph.D., University of Utah, 1988. Finance.
- Meservy, Rayman D. (1989) Ph.D., University of Minnesota, 1985. Audit/Information Systems.
- Palmer, Glen O. (1964) M.Acc., Brigham Young University, 1963. Tax.
- Peterson, Fredric G. (1973) Ph.D., University of Utah, 1973. Quantitative Methods.
- Stice, James D. (1988) Ph.D., University of Washington, 1989. Financial Accounting.

Graduate Program and Degree

Master of Accountancy (M.Acc.)

The Master of Accountancy (M.Acc.) Program, administered through the School of Accountancy and Information Systems within the Graduate School of Management, offers a general background in accounting, with an emphasis on business-related subjects and an in-depth study of one or more areas of accounting specialization. The M.Acc. degree is awarded on completion of a professional program, which can begin as early as the junior year of the undergraduate program and culminate in the Graduate School of Management after the fifth year. Students entering the School of Accountancy and Information Systems Program with a baccalaureate degree in accounting can complete the program in less than two years.

Joint Programs

The university has approved two joint programs whereby qualified students may obtain both the M.Acc. and another graduate degree during a specified period of time by meeting certain requirements:

- Joint J.D./M.Acc. program in law and accounting.
- Joint M.Acc./M.B.A. program in accounting and business administration.

Inquiries regarding these programs should be directed to the School of Accountancy and Information Systems, 560 TNRB.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Courses Offered

The School of Accountancy and Information Systems offers two types of courses: accounting courses with an Acc. prefix, and information systems courses with an ISys. prefix.

Program and Degree Requirements

Master of Accountancy (M.Acc.)

Refer to the Graduate School of Management Bulletin and the School of Accountancy and Information Systems Student Guide and Handbook for details regarding this program. The following outline does not represent the full range of requirements and opportunities in the program.

Admission and Entry

Application requirements:

- A. Deadlines: University deadlines apply.
- B. Entrance examination: GMAT with minimum score of 500.
- C. Complete GSM application.
- D. GPA: Minimum of 3.0.

Requirements for Degree

I. Required courses:

- A. First year (for students seeking B.S. and M.Acc. concurrently): Acc. 342, 401, 402, 411, 421, ISys. 451; BusM. 341; ManEc. 301; MCom. 320.
- B. Common requirements: Acc. 503, 561; BusM. 301; MCom. 641, 642, 643; OrgB. 540 or equivalent; MBA 582.

C. Specialties:

1. Information systems-auditing: Acc. 505, 522, 532, 562, 609, 691R; ISys. 548, 552, 645, 665; two of elective group A (organizational behavior elective, finance elective, ManEc. 353), two of elective group B (other specified GSM courses).
2. Information systems-consulting: Acc. 376, 532, 562, 609, 691R; ISys. 552, 643, 645, 646, 657; two of elective group A (organizational behavior elective, MBA 630, MBA financial set 620-627), two of elective group B (other specified GSM courses).
3. Management accounting: Acc. 532, 612, 616, 691R, ISys. 552, MBA 680, 624 (or ManEc. 353), 630 (or finance elective), two of elective group A (Acc. 505, 522, ISys. 645), three of elective group B (other specified GSM courses).
4. Tax: Acc. 505, 523, 556, 609 (or MBA 680), 620, 621, 622, 623, 624, ManEc. 575, one of elective group A (Acc. 625, 626, 628, 629), one of elective group B (Acc. 507, 562, 584, ISys. 645, 657), one of elective group C (Acc. 532, financial set 620-628, 686, 687, OrgB. 642), one of elective group D (Acc. 343, 599R, other specified GSM course or any law course except Law 601, 640, 641).

- II. See School of Accountancy and Information Systems for additional requirements. This program is best completed in the manner and sequence recommended by the school.

Accountancy Graduate Courses

See the Graduate School of Management Bulletin for detailed course descriptions.

503. Intermediate Accounting 3. (3)
505. Special Problems in Accounting 1. (3)
507. Accounting for Nonprofit Organizations. (3)
522. Advanced Taxation. (3)
523. Tax Research Methodology. (3)
532. Advanced Mathematics of Business. (3)
556. Computer Applications in Tax Practice. (3)
561. Auditing. (3)
562. Financial Auditing Methodology. (3)
584. International Accounting and Multinational Enterprises. (3)
586. Contemporary Professional Accounting Problems. (3)
- 599R. Accounting Internship. (3V)
609. Professionalism, Policy in an Accounting Environment. (3)
612. Managerial Cost Accounting. (3)
616. Operational Auditing. (3)
620. Special Problems in Federal Taxation. (3)

621. Corporate Taxation 1. (3)
622. Corporate Taxation 2. (3)
623. Taxation of Partnerships. (3)
624. Taxation of Estates, Gifts, and Fiduciaries. (3)
- 625R. Current Tax Policy. (1-3)
626. Taxation of Deferred Compensation and Fringe Benefits. (3)
628. Taxation of Foreign Income. (3)
629. Tax Planning for Families and Organizations. (3)
657. Management Consulting. (3)
- 691R. Research Seminar. (2)
- 693R. Reading and Conference. (1-3)

Information Systems Graduate Courses

See the Graduate School of Management Bulletin for detailed course descriptions.

544. Information Systems Design. (3)
546. Fourth Generation Programming Languages. (3)
548. Data Communications. (3)
552. Application Computing. (3)
- 590R. Seminar in Information Systems. (1-3)
- 599R. Cooperative Business Experience Internship. (1-3)
643. Advanced Information Systems Analysis. (3)
644. Advanced Information Systems Design. (3)
645. Advanced Database Analysis and Design. (3)
646. Advanced Fourth Generation Programming Languages. (3)
655. Management of Information Systems. (3)
657. Management Consulting and Projects. (3)
658. Seminar in Information Systems. (3)
665. EDP Auditing and Controls. (3)
- 690R. Special Topics in Information Systems. (1-3)
- 697R. Graduate Research. (1-9)

Business Administration

Master of Business Administration Program Director:
Darral G. Clarke, 640 TNRB, 378-3500

Faculty/Specialties

Professors

- Andrus, Roman R. (1976) Ph.D., Columbia University, 1965. Marketing.
- Barnes, Howard W. (1964) M.B.A., University of Southern California, 1963; Dr. rer. pol., Technical University of Brunswick, FRG, 1968. Marketing/International Business.
- Bryson, Phillip J. (1988) Ph.D., Ohio State University, 1967. Economics.

- Call, Ivan T. (1963) D.B.A., Indiana University, Bloomington, 1969. Financial Management, Management of Financial Institutions.
- Daines, Robert H. (1959) D.B.A., Indiana University, 1966. Finance.
- Geurts, Michael D. (1975) Ph.D., University of Oregon, 1972. Sales Forecasting, Marketing Research.
- Giaque, William C. (1977) D.B.A., Harvard University, 1972. Quantitative Business Analysis.
- Hill, Ned C. (1987) Ph.D., Cornell University, 1976. Finance.
- Hunt, H. Keith (1975) Ph.D., Northwestern University, 1972. Marketing.
- McKinnon, Gary F. (1969) Ph.D., University of Texas, Austin, 1968. Marketing.
- Schill, Ronald L. (1971) Ph.D., University of Oregon, 1971. Industrial Marketing/Procurement, Sales Management.
- Smith, Milton E. (1966) Ph.D., University of Utah, 1981. Management of Financial Institutions, Insurance.
- Smith, Scott M. (1981) Ph.D., Pennsylvania State University, 1979. Marketing.
- Stone, Bernell K. (1986) Ph.D., Massachusetts Institute of Technology, 1968. Finance.
- Swinyard, William R. (1978) Ph.D., Stanford University, 1976. Marketing, Consumer Behavior.
- Waters, Max L. (1958) Ed.D., Colorado State College, 1963. Communication.

Associate Professors

- Adolphson, Donald L. (1980) Ph.D., University of Wisconsin, Madison, 1973. Operations.
- Cox, Charles M. (1965) Ph.D., University of Washington, 1978. Corporate Finance.
- Hartman, Larry D. (1984) Ed.D., Oklahoma State University, 1973. Communication.
- Heaton, Hal B. (1982) Ph.D., Stanford University, 1983. Finance.
- Jackson, W. Burke (1973) Ph.D., Stanford University, 1978. Operations Management and Manufacturing Strategy.
- Jenkins, James W. (1979) Ph.D., Purdue University, 1975. Finance.
- Lambert, William R. (1962) D.B.A., Indiana University, Bloomington, 1968. Investments.
- Lee, Terry Nels (1970) Ph.D., University of Washington, 1973. Production, Quantitative Methods.
- Nelson, R.D. (1981) Ph.D., University of California, Berkeley, 1975. Managerial Economics.
- Plenert, Gerhard J. (1990) Ph.D., Colorado School of Mines, 1987. Operations.
- Rinne, Heikki (1984) Ph.D., Purdue University, 1981. Marketing.
- Sawaya, William J., Jr. (1978) Ph.D., Arizona State University, 1971. Operations Management.
- Wilson, Brent D. (1979) D.B.A., Harvard University, 1969. International Business.

Assistant Professors

- Beck, John Christen (1989) Ph.D., Harvard University, 1989. Policy, Organizational Behavior.
- Hanson, Kaye (1989) Ph.D., Brigham Young University, 1983. Communication.
- McQueen, Grant R. (1989) Ph.D., University of Washington, 1989. Finance.
- Swenson, Michael J. (1989) Ph.D., University of Oregon, 1980. Marketing.

- Thompson, Michael P. (1988) Ph.D., Rensselaer Polytechnic Institute, 1985.
- Whitlark, David B. (1989) Ph.D., University of Virginia, 1988. Marketing, Operations.

The Master of Business Administration Program draws its faculty from the departments of the Marriott School of Management. The following faculty members are listed with their various departments:

- Dwight M. Blood, Managerial Economics
 Darral G. Clarke, Managerial Economics
 Robert G. Crawford, Managerial Economics
 Gene W. Dalton, Organizational Behavior
 W. Gibb Dyer, Organizational Behavior
 John W. Hardy, Accounting
 David Kirkwood Hart, Public Management
 Keith Richard Howe, Accounting
 Reba L. Keele, Organizational Behavior
 Kate Kirkham, Organizational Behavior
 James B. McDonald, Managerial Economics
 Lynn J. McKell, Accounting
 Christopher Meek, Organizational Behavior
 Ray Nelson, Managerial Economics
 Robert J. Parsons, Public Management
 Brent D. Peterson, Organizational Behavior
 Lee H. Radebaugh, Accounting
 J. Dean Rickenbach, Managerial Economics
 J. Bonner Ritchie, Organizational Behavior
 Dave N. Stewart, Accounting
 Dale H. Taylor, Accounting
 Margaret J. Wheatley, Public Management
 Gloria E. Wheeler, Public Management
 J. Morgan White, Accounting
 Alan L. Wilkins, Organizational Behavior

Graduate Program and Degree

Master of Business Administration (M.B.A.)

Program and Degree Requirements

The Master of Business Administration Program is a two-year program designed to prepare the graduate student for a career in business. Currently the program presents a new and exciting approach to teaching business management. Courses are integrated across disciplines in order to use faculty expertise from different points of view. Concept papers are alternated with case study days to improve practical application.

During the first year, concepts are taught in the following subjects: finance, marketing, operations, organizational behavior, communications, accounting, managerial economics, and management strategy. During the second year elective courses are selected that emphasize the student's interests. Increasingly international focus and entrepreneurship are encouraged to better prepare the student for the world of business.

The curriculum has been designed to achieve the two-fold task of giving the student (1) a general management education and (2) depth in area(s) bearing specifically on personal professional interests.

Students who complete the program will have (1) acquired an understanding of business and management tools and principles that have enduring significance in a changing environment, (2) developed advanced

knowledge in a field of concentration in the area of the student's major interest, (3) achieved an understanding of the utilization of quantitative methods and behavioral sciences in the solution of business problems, (4) obtained skills in critical analysis and careful reasoning, and (5) strengthened their ability to communicate effectively.

Areas of Emphasis

Accounting, managerial economics, finance, human resource management, information systems, global management, organizational behavior, marketing, production and operations management, quantitative methods.

Master of Business Administration (M.B.A.)

M.B.A. classes are generally not available to students other than those in the following programs: master of business administration, juris doctor/master of business administration, master of business administration/master of accountancy, master of business administration/master of arts in international and area studies, or master of organizational behavior. All first-year M.B.A. classes are required for graduation.

Graduate students from other colleges can add M.B.A. classes on the following bases:

—To add a first-year M.B.A. class (500 series), students are required to submit a formal request to the M.B.A. Executive Committee for approval. Students should understand that first-year classes are not generally available to non-M.B.A. students.

—M.B.A. second-year classes (600 series) can be added with the approval of the professor teaching the course.

—All M.B.A. classes must be added by using an add/drop card and obtaining a signature from the M.B.A. Office, 640 TNRB.

Executive M.B.A. Program

The Executive Master of Business Administration Program is a rigorous program in general management for fully employed professionals. It consists of courses similar to the full-time M.B.A. Program but is unique in reflecting the work and management experience of the Executive M.B.A. Program students. The Executive M.B.A. Program is designed for managers and professionals who typically have three to four years of full-time managerial work experience.

Obtaining an M.B.A. degree through the Executive M.B.A. Program requires a year-round commitment for two years. Class sessions are generally held two evenings each week and occasionally on Saturdays. Students spend one residency week on campus each year in a complex case analysis and other concentrated study.

For details concerning admission requirements and application dates, refer to the Graduate School of Management Bulletin or consult the Executive M.B.A. Office.

Joint Programs with Other Disciplines

The university has approved three programs whereby qualified students may obtain both the M.B.A. and another graduate degree during a specified period of time by meeting certain requirements:

Joint J.D./M.B.A. program in law and business administration

Joint M.B.A./M.A. program in business administration and international and area studies

Joint M.B.A./M.Acc. program in business administration and accounting

Inquiries about any of these programs should be directed to the M.B.A. Office.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Master of Business Administration (M.B.A.)

See the Graduate School of Management Bulletin for details regarding this program.

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examination: GMAT with a minimum score of 500.

GPA: Minimum 3.0 on 4.0 scale.

II. Prerequisite:

A. Baccalaureate degree from an accredited institution.

B. Background in college algebra and a basic course in computer programming. Recommended: Background in accounting, calculus, economics, and statistics.

III. Entry time: Fall semester only.

Requirements for Degree

I. Required courses:

A. First-year program: Courses in financial management, marketing management, operations management, managerial economics, macroeconomics and the business environment, business and government, managerial accounting, quantitative methods, computers and management, organizational behavior, written and oral communication, and management simulation.

B. Second-year program: Courses in business policy, and business and society.

II. Electives: See M.B.A. Policies and Procedures publication.

III. Areas of concentration: Accounting, managerial economics, finance, human resource management, information systems, global management, organizational behavior, marketing, production and operations management, quantitative methods.

IV. Consult Graduate School of Management Bulletin for additional requirements.

Master of Business Administration Courses

Refer to the Graduate School of Management Bulletin for detailed course descriptions.

Required Courses:

97R. Computers for Business Analysis. (0)

500. Corporate Financial Reporting. (2.5)

501. Managerial Accounting 1. (2.5)

510. Managerial Economics. (2.5)
511. Macroeconomics and Business Environment. (2.5)
520. Business Finance 1. (2.5)
521. Business Finance 2. (2.5)
530. Statistical Analysis. (2)
531. Quantitative Methods. (2)
533. Operations Management 1. (2.5)
534. Operations Management 2. (2.5)
540. Organizational Behavior. (2)
541. Management and Organization Development. (2)
543. Executive Organizational Behavior. (2.5)
550. Marketing Management 1. (2.5)
551. Marketing Management 2. (2.5)
560. Integrative Exercise. (1)
561. Written and Oral Communication 1. (2.5)
562. Written and Oral Communication 2. (2)
563. Management Simulation. (1)
582. (MBA—OrgB.)Ethics, Business, and Society. (3)
583. Management and Information Systems. (3)
680. Business Policy. (3)
- Electives:
601. Managerial Accounting 2. (3)
602. Federal Income Taxation. (3)
603. Corporate Accountability 1. (3)
604. Corporate Accountability 2. (3)
605. Auditing and Corporate Control. (3)
606. Seminar in Current Accounting Problems. (3)
610. Advanced Managerial Economics: Theory and Application. (3)
611. National and International Business Environment. (3)
613. Business and Economic Forecasting: Theory and Applications. (3)
- 615R. Seminar in Managerial Economics. (3) On dem.
618. Personal Financial Planning. (3)
620. Corporate Financial Strategy. (3)
621. Advanced Topics in Finance. (3)
622. Investments. (3)
623. Investment Analysis and Portfolio Theory. (3)
624. Capital and Security Markets. (3)
625. Management of Financial Institutions. (3)
626. Seminar in Finance. (3)
627. International Finance. (3)
628. Futures and Options Markets. (3)
629. Silver Fund. (3)
630. Advanced Quantitative Methods. (3)
631. Advanced Data Analysis. (3)
632. Systems Simulation. (3)
634. Advanced Operations Management. (3)
635. Systems Analysis and Design. (3)
636. Operations Management Seminar. (3)
638. Strategic Issues in Manufacturing. (3)
640. Dynamics of Interpersonal Behavior. (3)
641. Leadership in Organizations. (3)
642. Career Development. (3)
643. Management Philosophy and Style. (3)
644. Advanced Personnel and Human Resource Administration. (3)
645. Managing Organization Cultures. (3)
646. Organizational Theory. (3)
647. Advanced Seminar in Organizational Behavior. (3)
648. The Dynamics of Organization Change: Interventions and Strategies. (3)
650. Marketing Research and Information Systems. (3)
651. Buyer Behavior and Marketing Decisions. (3)
652. Quantitative Methods and Market Analysis. (3)
653. Seminar in Marketing. (3)
654. Sales Management. (3)
655. Retailing Management. (3)
656. Business-to-Business Negotiating. (3)
657. Product Management. (3)
658. International Marketing. (3)
659. Business-to-Business Marketing. (3)
660. Advanced Strategic Marketing. (3)
683. New Enterprise Management. (3)
684. International Business Management. (3)
685. Business Law. (3)
686. Real Estate Management. (3)
687. Risk Management. (3)
688. Applied Econometrics. (3)
690. Strategic Planning. (3)
691. Field Consulting. (3)
692. Business in History. (3)
- 693R. Readings and Conference. (1–3)

Organizational Behavior

Program Director: Warner P. Woodworth, 790 TNRB,
378-2666

Faculty/Specialties

Professors

- Cherrington, David J. (1973) D.B.A., Indiana University, Bloomington, 1970. Personnel Management.
- Keele, Reba L. (1969) Ph.D., Purdue University, 1974. Work and the Family; Mentoring.
- Pace, R. Wayne (1978) Ph.D., Purdue University, 1960. Human Resources, Training and Development.
- Peterson, Brent D. (1972) Ph.D., Ohio University, 1970. Human Resources, Consulting.
- Ritchie, J. Bonner (1973) Ph.D., University of California, Berkeley, 1968. Organizational Philosophy and Theory.
- Stephan, Eric G. (1968) Ph.D., University of Utah, 1966. Human Resources, Leadership.
- Wilkins, Alan (1978) Ph.D., Stanford University, 1979. Organizational Culture and Control.
- Woodworth, Warner P. (1976) Ph.D., University of Michigan, 1974. Industrial Democracy, Worker Ownership.

Associate Professors

- Dyer, W. Gibb, Jr. (1984) Ph.D., Massachusetts Institute of Technology, 1984. Organizational Evolution/Culture/Management of Family-owned Firms.
- Kirkham, Kate L. (1978) Ph.D., Union Graduate School, 1977. Organizational Development Training.
- Meek, Christopher B. (1984) Ph.D., Cornell University, 1983. Labor-Management Cooperation, Organizational Ethics.
- Perry, Lee T. (1985) Ph.D., Yale University, 1982. Strategies for Declining Organizations, Turbulent Business Environments.

Graduate Program and Degree

Master of Organizational Behavior (M.O.B.)

Organizational behavior is a relatively new professional field dedicated to creating compatibility between organizational goals and human values. Emphasizing the applied behavioral sciences, this two-year professional program is designed to prepare competent and ethical specialists. The master's degree program in organizational behavior is small, highly selective, and designed to meet the needs of individuals in two categories: (1) those who wish to take a position in an organization working in human resource management, training and development, labor relations, and internal consulting; (2) those who later plan to pursue a doctoral degree in organizational behavior and then to enter university teaching, consulting, or equivalent positions in industry.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Master of Organizational Behavior (M.O.B.)

See the Graduate School of Management Bulletin for details regarding this program.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: GMAT or GRE; score subject to review.
 - C. GPA: Minimum of 3.0 on 4.0 scale for last 60 hours.
- II. Prerequisite: Baccalaureate degree in compatible field.
- III. Interpersonal competence; interests and values consistent with a career in organizational behavior.
- IV. Entry time: Fall semester.

Requirements for Degree

Individual course requirements will be determined in consultation with program director. Recommended courses include OrgB. 630, 689; MBA 540, 541, 582; Soc. 521; OrgB. 625, 640, 645, 670, 680.

Organizational Behavior Graduate Courses

Refer to the Graduate School of Management Bulletin for detailed course descriptions.

531. **Managing Entrepreneurial Firms and Family Businesses.** (3)
540. **Organizational Behavior.** (3)
551. **Theory and Practice of Third-World Development.** (3)
561. **Labor Relations.** (3)
582. **(OrgB.-MBA) Ethics, Business, and Society.** (3)
610. **Management Philosophy and Style.** (3)
614. **Organizational Communication.** (3)
616. **Industrial Democracy.** (3)
625. **Advanced Personnel and Human Resource Administration.** (3)
630. **Dynamics of Interpersonal Behavior.** (3)
635. **Diagnosing Human Resources and Communication Systems.** (3)
636. **Diversity and Discrimination in Organizations.** (3)
637. **Improving Human Resources and Communication Systems.** (3)
640. **Organizational Theory.** (3)
645. **Managing Organization Cultures.** (3)
650. **Research Design and Data Analyses.** (3)
657. **Design, Media, and Computers in Human Resource Development.** (3)
- 660R. **Advanced Seminar in Organizational Behavior.** (1-3)

- 669R. Readings in Organizational Behavior. (1-6)
- 670. Dynamics of Organization Change: Interventions and Strategies. (3)
- 672. The Consultative Process. (3)
- 679R. Practicum in Organizational Development. (1-6)
- 680. Organization Behavior Research Report. (3)
- 689R. Continuous Professional Development Seminar. (1-3)

Institute of Public Management

Institute of Public Management Director: N. Dale Wright,
760 TNRB, 378-4221

Faculty/Specialties

Professors

- Hart, David K. (1983) Ph.D., Claremont Graduate School, 1965. Ethics.
- Knighton, Lennis M. (1971) Ph.D., Michigan State University, 1966. Accounting, Finance, Performance Evaluation.
- Parsons, Robert J. (1970) Ph.D., University of California, Riverside, 1971. Managerial Economics.
- Snow, Karl N., Jr. (1962) Ph.D., University of Southern California, 1972. Public Finance and Budgeting.
- Wright, N. Dale (1968) Ph.D., University of Southern California, 1972. Organizational Behavior and Theory.

Associate Professors

- Buckwalter, Doyle W. (1968) Ph.D., University of Michigan, 1968. Urban Management, Public Policy.
- Claus, Karen E. (1989) Ph.D., Stanford University, 1968. Local Government Law and Organization Behavior.
- Cornia, Gary C. (1980) Ph.D., Ohio State University, 1979. Public Finance and Budgeting.
- Wheatley, Margaret J. (1989) Ed.D., Harvard University, 1979. Ethics and Organization Behavior.
- Wheeler, Gloria Eileen (1978) Ph.D., University of Michigan, 1972. Quantitative Analysis and Statistics.

Assistant Professor

- Walters, Lawrence C. (1985) Ph.D. University of Pennsylvania, 1987. Quantitative Methods and Public Policy.

Graduate Program and Degree

Master of Public Administration (M.P.A.)

The objective of the Master of Public Administration (M.P.A.) Program is to prepare men and women for leadership in the public and not-for-profit sectors. Leadership in this context provides unique opportunities for service to others. Though emphasis is placed on management of government and not-for-profit organizations, many M.P.A. graduates have found their skills to be transferable to the private sector as well.

Executive M.P.A. Program

An Executive M.P.A. Program is offered through the Division of Continuing Education. Persons with significant public management experience who desire to pursue the master's degree program through evening school while

continuing to work full-time are encouraged to apply. All courses in the program are offered in the evenings.

J.D./M.P.A. Program

The university has approved a joint J.D./M.P.A. four-year degree for certain qualified students.

Inquiries regarding the Executive M.P.A. Program and the J.D./M.P.A. Program should be directed to the Institute of Public Management, 760 TNRB.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Master of Public Administration (M.P.A.)

See the Graduate School of Management Bulletin for details regarding this particular program.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: GMAT; minimum score of 500.
 - C. GPA: Minimum of 3.0 on 4.0 scale for last 60 hours.
 - D. A general career interest in public management as reflected in the statement of intent.
- II. Prerequisite: Upon acceptance, applicant will be informed of any background deficiencies.
- III. Entry time: Fall semester remains the entry semester; however, some exceptions may be made for applicants in the Executive M.P.A. Program.

Requirements for Degree

- I. Credit hours (64): Minimum 64 course work hours.
- II. Required courses:
 - A. Public administration environment: PMgt. 610, 682, 684.
 - B. Human resource management: PMgt. 640, 641, 643.
 - C. Financial resources management: PMgt. 603, 604, 622, 623.
 - D. Decision making and analysis: PMgt. 630, 634, 642R, 685.
 - E. Communication: PMgt. 660, 661.
- III. Electives: Determined in consultation with faculty advisor. Some may be taken in other graduate departments.
- IV. Consult Institute of Public Management, 760 TNRB, for additional requirements.

Institute of Public Management Graduate Courses

Refer to the Graduate School of Management Bulletin for detailed course descriptions.

- 603. Managerial Accounting. (1-3)
- 604. Management Cost Analysis. (1-3)
- 607. Program Auditing and Evaluation. (3)

- 610. Managerial Economics. (3)
- 619R. Seminar in Economic Analysis. (1-3)
- 622. Financing Public Services. (3)
- 623. Budgeting. (1-3)
- 625. Debt Management. (3)
- 626. Tax Policy and Management. (3)
- 627. Cash Management and the Investment of Funds. (2)
- 629R. Seminar in Financial Management. (1-3)
- 630. Quantitative Analysis. (3)
- 634. Computer Concepts for Management. (1-3)
- 635. Systems Analysis and Design. (3)
- 638. Research Methods. (3)
- 640. Personnel Management and Labor Relations. (3)
- 641. Management and Organization Development. (3)
- 642R. Management Development Seminar. (0-3)
- 643. Management Philosophy and Style. (3)
- 645. Collective Bargaining. (3)
- 646. Labor Contract Management. (3)
- 647. Personnel Planning. (3)
- 649R. Personnel Administration and Organization Behavior Seminar. (1-3)
- 659R. Seminar in International Management. (1-3)
- 660. Written Communications. (1-2)
- 661. Oral Communications. (1)
- 675. Urban Management. (3)
- 676. Urban and Regional Planning. (3)
- 677. Public Works Management. (3)
- 678. Intergovernmental Administrative Relations. (1-3)
- 679R. Seminar in Local Government Administration. (1-3)
- 681. Legal Concepts for Managers. (2)
- 682. Ethics for Management. (3)
- 684. Public Institutions, Structures, and Processes. (3)
- 685. Management Strategy and Organization Policy. (3)
- 688. Business and Government Relations. (3)
- 689. Public Policy Analysis. (3)
- 691R. Directed Readings and Conference. (1-3)
- 692R. Directed Research. (1-3)
- 693R. Practicum. (1-4)

Engineering Management and Technology Management

The Graduate School of Management, in conjunction with the College of Engineering, offers courses for students in the Master of Engineering Management and the Master of Technology Management programs. See page 93 of this catalogue for more details.

Management Communication

Chair: William H. Baker (590 TNRB, 378-4081)

The Department of Management Communication does not offer a graduate degree but offers the following graduate courses. Refer to the BYU General Catalogue for faculty listings.

641. Communication for Professional Accounting 1. (1.5)
Prerequisite: MCom. 320.

Theory and application of written and oral communication for professional accounting.

642. Communication for Professional Accounting 2. (1)
Prerequisite: MCom. 641.

Continuation of MCom. 641.

643. Communication for Professional Accounting 3. (0.5)
Prerequisite: MCom. 641, 642.
Continuation of MCom. 642.

Managerial Economics

Acting Chair and Graduate Coordinator: Dwight M. Blood, 610-A TNRB, 378-2364

Faculty/Specialties

Professors

- Blood, Dwight M. (1980) Ph.D., University of Michigan, 1963. Micro and Macro Theory; Macro Policy.
- Clarke, Darral G. (1985) Ph.D., Purdue University, 1972. Quantitative Methods; Economic Marketing Analysis, Strategic Planning, Decision Making.
- McDonald, James B. (1972) Ph.D., Purdue University, 1970. Quantitative Methods, Econometrics.
- Pritchett, B. Michael (1969) Ph.D., Purdue University, 1970. Quantitative Methods, Econometrics.

Associate Professors

- Crawford, Robert G. (1972) Ph.D., Carnegie-Mellon University, 1975. Business Economics.
- Koller, Roland H., II (1969) Ph.D., University of Wisconsin, Madison, 1969. Economics, Industrial Organization.
- Nelson, Ray D. (1985) Ph.D., University of California, Berkeley, 1981. Speculative Markets, Applied Statistical Modeling, Decision Making Under Uncertainty.
- Rickenbach, J. Dean (1957) Ph.D., Indiana University, Bloomington, 1963. Business, Microeconomics, Real Estate.

Graduate Program and Degree

Managerial Economics (M.S.)

A graduate specialty in managerial economics has proven valuable to several types of students. Among these are (1)

those seeking a distinct specialty as part of a professional degree, such as the M.B.A., M.P.A., or law degrees; (2) those seeking positions that require ability to apply economic analysis as well as an awareness of broad economic or management principles; and (3) those wishing to strengthen their training before entering (or applying for) a Ph.D. or other graduate program.

Experience in placing graduates suggests that students are well served by a strong (often quantitative) specialty. Nevertheless, such a specialty is often best developed in a context including the study of management, government, and the economy.

Members of the faculty are available to consult with students concerning their careers, degree alternatives, plans of study, and career development.

Of special interest to entering M.B.A. students with an undergraduate degree in economics (or considerable undergraduate training in economics) is the concentration in managerial economics offered in the M.B.A. Program. Interested students should see the department chair for further information.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Managerial Economics (M.S.)

This degree emphasizes training in applied economic analysis and specialties. Typical students become especially knowledgeable in model formulation and estimation. They learn forecasting methods and other analytical techniques used in managerial decision making. Graduates are trained in empirical and analytical techniques related to firms, industries, and the national and international economic environment.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: GMAT, GRE, or equivalent; score subject to review.
 - C. TOEFL or Michigan Test in English required of international students who do not speak English as their first language.
- II. Prerequisite: Intermediate microeconomic and macroeconomic theory, principles of statistics (3 hours), and introductory calculus (3 hours).

Requirements for Degree

- I. Credit hours:
 - A. Thesis option (30): Minimum 24 course work hours plus 6 thesis hours (ManEc. 699R).
 - B. Project option (33): Minimum 33 course work hours plus major research project.
- II. Consult department for full program description and additional course requirements.
- III. Examination: Oral defense of thesis or project.

Managerial Economics Graduate Courses

552. Urban Analysis. (3)

Prerequisite: ManEc. 200, 301, or equivalent.

Applying economic theory to urban problems and policies.

576. Topics in Government and Business. (3)

Prerequisite: ManEc. 300, 301, or consent of instructor.

Analyses of either antitrust or public regulation of business (varies with semester).

589R. Mathematical Theory of Managerial Economics. (3)

Prerequisite: ManEc. 300, 301, 486, or consent of instructor.

Mathematics of optimization as applied to economic decisions.

594R. Seminars in Selected Managerial Economics Topics. (1-6)

Prerequisite: consent of instructor.

Seminars covering a variety of topics in economic policy and theory.

595R. Lectures in Managerial Economics. (1-3)

Prerequisite: consent of instructor.

596R. Readings in Managerial Economics. (1-3)

Prerequisite: consent of instructor.

597R. Research in Managerial Economics. (1-3)

Prerequisite: consent of instructor.

610. Advanced Managerial Economics: Theory and Applications. (3)

Applying economic principles to a broad range of problems facing management, from an economic consultant's point of view.

611. National and International Business Environment. (3)

Macroeconomy presented at an intermediate level with special attention to government and international trade sectors.

613. Business and Economic Forecasting: Theory and Applications. (3)

Forecasting methodologies with an emphasis on time series analysis. Practical applications.

615R. Seminar in Managerial Economics. (3) On dem.

Preparing and presenting economic analysis to line managers.

688. Applied Econometrics. (3)

Prerequisite: ManEc. 200, 301, calculus or equivalent, and a first course in econometrics.

Econometric techniques and applications.

689. Advanced Econometric Techniques. (3)

Prerequisite: ManEc. 688 or Econ. 388.

Econometric techniques such as time series analysis, nonlinear estimation techniques, and simultaneous equation models.

699R. Master's Thesis. (3-6)

Mathematics

Chair: Donald W. Robinson, 290 TMCB, 378-2061

Associate Chair: Louis J. Chatterley, 288 TMCB, 378-3286

Graduate Coordinator: Gerald Armstrong, 372 TMCB, 378-7407

Faculty/Specialties

Orson Pratt Professor

Cannon, James W. (1986) Ph.D., University of Utah, 1969.
Geometric Topology.

Professors

Barrett, Wayne Walton (1981) Ph.D., New York University, 1975. Matrix Theory and Applied Mathematics.

Bates, Peter W. (1984) Ph.D., University of Utah, 1976.
Partial Differential Equations.

Chatterley, Louis J. (1962) Ph.D., University of Texas, Austin, 1972. Mathematics Education.

Crawley, Peter L. (1971) Ph.D., California Institute of Technology, 1961. Infinite Groups.

Fearnley, Lawrence (1957) Ph.D., University of London, 1970. Topology.

Ferguson, Helaman R. P. (1971) Ph.D., University of Washington, 1971. Group Representations.

Fletcher, Harvey J., Jr. (1980) Ph.D., University of Utah, 1954. Applied Mathematics.

Forcade, Rodney W. (1981) Ph.D., University of Washington, 1971. Combinatorics.

Gamer, Lynn E. (1963) Ph.D., University of Oregon, 1968.
Geometry, Commutative Algebra, Number Theory.

Gill, Gurcharan S. (1960) Ph.D., University of Utah, 1965.
Functional Analysis.

Hansen, Richard A. (1967) Ph.D., University of Utah, 1965.
Numerical Analysis.

Lamoreaux, Jack W. (1968) Ph.D., University of Utah, 1967.
Topology.

Lang, William E. (1989) Ph.D., Harvard University, 1978.
Algebraic Geometry.

Moore, Hal G. (1961) Ph.D., University of California, Santa Barbara, 1967. Ring Theory.

Peterson, John Milo (1965) Ph.D., University of Georgia, 1965. Mathematics Education.

Pollington, Andrew D. (1982) Ph.D., University of London, 1978. Number Theory.

Robinson, Donald W. (1956) Ph.D., Case Institute of Technology, 1956. Linear Algebra.

Snow, Donald Ray (1969) Ph.D., Stanford University, 1965.
Calculation of Variations, Functional Equations.

Speiser, Robert David (1984) Ph.D., Cornell University, 1970. Algebraic Geometry and Commutative Algebra.

Wight, Theodore A. (1963) Ed.D., University of Utah, 1969.
Mathematics Education.

Wright, David G. (1983) Ph.D., University of Wisconsin, Madison, 1973. Geometric Topology.

Associate Professors

Armstrong, Gerald M. (1970) Ph.D., University of Wisconsin, Madison, 1971. Real Analysis.

Chahal, Jasbir S. (1981) Ph.D., Johns Hopkins University, 1979. Algebraic Number Theory.

Garbe, Douglas G. (1963) Ph.D., University of Texas, Austin, 1973. Mathematics Education.

Skarda, R. Vencil (1965) Ph.D., California Institute of Technology, 1965. Functional Analysis.

Smith, William V. (1985) Ph.D., University of Utah, 1978.
Spectral Theory.

Tolman, L. Kirk (1965) Ph.D., University of New Mexico, 1972. Graph Theory.

Walter, Charles N. (1969) Ph.D., University of New Mexico, 1970. Algebraic Geometry and Ordered Fields.

Wynn, Jan Eugene (1966) Ph.D., Colorado State University, 1972. Padé Approximations.

Assistant Professors

Humphries, Stephen B. (1987) Ph.D., University of Wales, 1983. Low-dimensional Topology, Classical Groups.

Lu, Kening (1990) Ph.D., Michigan State University, 1988.
Applied Mathematics, Nonlinear Partial Differential Equations.

Graduate Programs and Degrees

Mathematics (M.S.)

Mathematics (M.A.)

Mathematics Education (M.A.)

Mathematics (Ph.D.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Mathematics (M.S.)

Admission and Entry

I. Application requirements:

A. Deadlines: University deadlines apply.

B. Entrance examinations: General and advanced mathematics GRE. Every international applicant whose native language is not English is required to submit TOEFL scores.

II. Prerequisite:

A. Credit at least equivalent to BYU requirements for a baccalaureate degree in mathematics.

B. A year's sequence in abstract algebra.

C. A year's sequence in advanced calculus.

Information for Degree—Thesis and Nonthesis Programs

I. Graduate mathematics courses: Approved graduate mathematics courses include all classes numbered 500 and above with the exceptions of 501, 502, and 508.

II. Faculty sponsor: The graduate coordinator will assign each student a faculty sponsor on admission to the graduate program. Students should communicate with the sponsor as soon as they arrive on campus.

Requirements for Degree—Thesis Program

I. Credit hours (30): Minimum 24 course work hours in approved graduate mathematics including 12 hours in courses numbered 600 or above and 6 thesis hours (Math. 699R).

II. Thesis.

III. Oral defense of thesis.

Requirements for Degree—Nonthesis Program

- I. Credit hours:
 - A. Traditional mathematics option (30). Minimum 30 course work hours in approved graduate mathematics including 18 hours in courses numbered 600 or above.
 - B. Minor option (33). Minimum 24 course work hours in approved graduate mathematics including 6 hours in courses numbered 600 or above and 9 hours in an approved minor.
 - C. Applied option (36). Minimum 24 course work hours in approved graduate mathematics including 6 hours in courses numbered 600 or above and 12 hours in areas related to applications of mathematics. The 12 hours of application must be approved by the graduate coordinator.
- II. Paper and presentation: Write a paper on an area of advanced mathematics and present a 45-minute talk based on the paper.
- III. Examination: Pass a written master's examination. Normally the examination must be taken no later than the end of the second year of graduate work and, preferably, before the end of three semesters of graduate study. This requirement may also be filled by a sufficiently high score on the Ph.D. written examination.

Mathematics (M.A.)

This program is designed to prepare students for teaching mathematics in junior college or secondary schools.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. GRE recommended; required for international applicants.
- II. Prerequisite: Credit at least equivalent to the current BYU requirements for a B.A. degree in education with a teaching major in mathematics, a B.A. degree in mathematics, or a B.S. degree in mathematics.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Math. 699R).
- II. State teacher certification (required certification courses may not be part of the graduate program).
- III. Required courses: Math. 541, 542, 629; any two-semester 600 sequence or Math. 551, 552.
- IV. Minor: Any approved minor.
- V. Thesis.
- VI. Examination: Oral defense of thesis.

Mathematics Education (M.A.)**Admission and Entry**

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: GRE recommended; required for international applicants.
- II. Prerequisite: In-service status as a secondary teacher of mathematics.

Requirements for Degree

- I. Credit hours (36): Minimum 36 course work hours (24 hours in mathematics, 12 hours in education). At least 20 hours must be in the 500 series or above.
- II. Required courses: Math. 629 and any seven courses selected from 300, 301, 302, 332, 343, 371, 387, 451R, or any other 500- or 600-level courses.
- III. Minor required: 12 hours in education.
 - A. Required course: ELdr. 531.
 - B. ELdr. 630, 696R; EPsy. 502, 564, 601; ScEd. 539R.
- IV. No thesis required.

Mathematics (Ph.D.)**Admission and Entry**

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examinations: General and advanced mathematics GRE. Every international applicant whose native language is not English is required to take the Test of English as a Foreign Language (TOEFL).
- II. Prerequisite:
 - A. Undergraduate degree in mathematics or its equivalent.
 - B. One year of mathematical analysis (or advanced calculus).
 - C. One year of abstract algebra, including linear algebra.

Requirements for Degree

- I. Credit hours (54): Minimum 36 course work hours in mathematics courses numbered 600 or above with a grade of B or better in each, plus 18 dissertation hours (Math. 799R).
- II. Required courses: Complete at least 3 hours each in algebra, analysis, applied mathematics, and geometry/topology.
- III. Examinations:
 - A. Written examinations: At the beginning of the second year, the student is required to pass examinations in three of the four areas of algebra, analysis, applied mathematics, and geometry/topology. Four hours are allotted to each examination. A failed examination may be repeated once at the beginning of the winter semester of the student's second year, after which permission must be obtained from the department graduate committee to retake the examination. Passed examinations need not be repeated. Syllabi are available for each examination.
 - B. Oral examination: A student must pass an oral qualifying examination covering the background necessary for research in a specific area. The student, having chosen a research area and having a dissertation advisor approved, will, with the advisor, outline suitable examination topics. These topics must be approved by an examination committee of three (including advisor) appointed by the department graduate committee, which conducts the examination.

- C. Defense of dissertation: A final oral defense of the dissertation is conducted by a faculty committee consisting of the student's research advisor, two other readers of the dissertation (one of whom may be an outside examiner), and two other members of the faculty.
- IV. Language requirement: Demonstrate proficiency in two approved foreign languages that are currently in major use in the mathematical literature. At present the approved languages are French, German, Russian, and Italian. Another language in certain cases may be substituted for one of these if the department graduate committee approves. The committee will consider the current usage of the language in the student's specialty area. The examinations are offered by the Mathematics Department twice a year. They are designed to test a student's ability to translate, with the aid of a dictionary, mathematical literature into scientifically correct English.
- V. Dissertation.

Mathematics Graduate Courses

501. Real Numbers. (3) F

Prerequisite: Math. 371.

Extensive examination of various axiomatic descriptions of the real numbers and interrelationships among these descriptions.

502. Set Theory. (3) W

Prerequisite: Math. 371.

Zermelo-Fraenkel axioms for set theory, the axiom of choice, ordinal and cardinal numbers, and algebra of sets.

512. Numerical Analysis. (3) On dem.

Prerequisite: Math. 411.

Theory of constructive methods in mathematical analysis.

513R. Advanced Topics in Applied Mathematics. (3) On dem.

Prerequisite: consent of instructor.

521, 522. Methods of Applied Mathematics. (3 ea.) F, W

Prerequisite: Math. 343, 434 (or 321).

Survey of current methods, continuous and discrete, including linear algebra, estimation, differential equations of equilibrium, eigenvalue and initial value problems; finite element, spectral, transform and difference methods; Fourier series, the Fourier matrix, fast Fourier transform; convolution.

529R. Topics in Mathematics Education. (3)

Prerequisite: consent of instructor.

Current research and curriculum in mathematics education nationally and internationally; research techniques and interpretation.

530. Calculus of Variations. (3) On dem.

Prerequisite: Math. 321 or 434; 343. Recommended: Math. 323, 541.

Euler-Lagrange equation, sufficient conditions, Hamilton's principle of least action, Dirichlet's principle; applications to mechanics, geometry, economics, eigenvalue problems, direct methods.

541. Multivariable Analysis. (3) W, Su

Prerequisite: Math. 315, 343, 344.

Rigorous treatment of multivariable calculus including implicit and inverse function theorems and differential forms.

542. Measure Theory. (3) F

Prerequisite: Math. 315, 343, 344 (not open to students with credit in Math. 641).

Lebesgue measure, integration theory, other measures, Banach spaces.

543. Advanced Probability. (3) Sp

Prerequisite: multivariable calculus. Recommended: Stat. 341 or 520.

Combinatorial methods, random walk, Markov chains, stochastic processes.

551, 552. Introduction to Topology. (3 ea.) F, W

Prerequisite: completion of Math. 315 for 551; Math. 551 for 552.

Axiomatic treatment of linearly ordered spaces, metric spaces, arcs, and Jordan curves; types of connectedness.

585. Matrix Analysis. (3) W

Prerequisite: Math. 343.

Special classes of matrices, canonical forms, matrix and vector norms, localization of eigenvalues, matrix functions, applications.

629. Teaching Mathematics in Secondary Schools. (3) On dem.

631, 632. Complex Analysis. (3 ea.) On dem.

Prerequisite: Math. 332, 542 for 631; Math. 631 for 632.

634, 635. Theory of Ordinary Differential Equations. (3 ea.) On dem.

Prerequisite: Math. 321 or 434; 647.

641, 642. Functions of a Real Variable. (3 ea.)

Prerequisite: Math. 542 or consent of instructor for 641; Math. 641 for 642.

643R. Special Topics in Analysis. (3) On dem.

Prerequisite: Math. 642.

Continued fractions, stochastic processes, generalized functions, etc.

647, 648. Theory of Partial Differential Equations. (3 ea.) On dem.

Prerequisite: Math. 323, 542 for 647; Math. 647 for 648.

651, 652. General Topology 1, 2. (3 ea.) On dem.

Prerequisite: consent of instructor.

653R. Special Topics in Geometry. (3) On dem.

Prerequisite: Math. 672.

Topics from n-dimensional projective and algebraic geometry, foundations, transformations, curves and surfaces, forms and sheaf theory.

655. Algebraic Topology 1. (3)

Prerequisite: consent of instructor.

656. Algebraic Topology 2. (3)

Prerequisite: Math. 655.

661, 662. Functional Analysis. (3 ea.) On dem.

Prerequisite: Math. 641 for 661; Math. 661 for 662.

671, 672. Algebra. (3 ea.)

Prerequisite: Math. 372 for 671; Math. 671 for 672.

673. Theory of Associative Rings. (3) On dem.

Prerequisite: Math. 671, 672.

Noncommutative rings: modules, structure theory, radicals, commutative theorems, principle ideal ring, embeddings and localization, dimension theories.

675R. Special Topics in Algebra. (3) On dem.

Prerequisite: Math. 672.

676. Commutative Algebra. (3) On dem.

Prerequisite: Math. 671, 672.

Commutative rings, modules, tensor products, localization, primary decomposition, Noetherian and Artinian rings, application to algebraic geometry and algebraic number theory.

677. Homological Algebra. (3) On dem.

Prerequisite: Math. 671, 672.

Chain complexes, derived functors, cohomology of groups, ext and tor, spectral sequences, etc. Application to algebraic geometry and algebraic number theory.

687R. Topics in Analytic Number Theory. (3) On dem.

Prerequisite: Math. 487, 642, and consent of instructor.

Current topics of research interest.

688R. Topics in Algebraic Number Theory. (3) On dem.

Prerequisite: Math. 487, 687R, and consent of instructor.

Current topics of research interest.

695R. Readings in Mathematics. (1-2)**699R. Master's Thesis.** (1-9)**751R. Advanced Special Topics in Topology.** (3) On dem.

Prerequisite: consent of instructor and Math. 651, 652.

Current topics in topology of research interest.

780R. Seminar in Algebraic Geometry. (3)

Topics selected from current research literature.

799R. Doctoral Dissertation. (Arr.)

Microbiology

Chair: Donald N. Wright, 775 WIDB, 378-2889

Graduate Coordinator: Sheril Dale Burton, 891 WIDB, 378-2449

Faculty/Specialties

Professors

Burton, Sheril Dale (1967) Ph.D., Oregon State University, 1964. Aquatic Microbial Ecology, Bacterial Chemistry.

Jensen, James B. (1989) Ph.D., Auburn University, 1976. Immunology, Parasitology.

Jensen, Marcus M. (1969) Ph.D., University of California, Los Angeles, 1961. Medical Microbiology, Avian Pathology.

Johnson, F. Brent (1972) Ph.D., Brigham Young University, 1970. Virology.

Murray, Byron K. (1983) Ph.D., Brigham Young University, 1971. Virology.

North, James A. (1965) Ph.D., University of Utah, 1964. Virology.

Sagers, Richard D., (1958) Ph.D., University of Illinois, 1958. Microbial Biochemistry.

Wright, Donald N. (1969) Ph.D., Iowa State University of Science and Technology, 1964. Clinical Microbiology.

Associate Professors

Anderson, Shauna C. (1974) Ph.D., University of Washington, 1984. Medical Technology, Clinical Chemistry.

Leavitt, Ronald W. (1977) Ph.D., University of California, San Diego, 1975. Molecular Biology.

Teuscher, Cory (1990) Ph.D., University of New Mexico, 1982. Immunology.

Woodward, Scott R. (1989) Ph.D., Utah State University, 1983. Molecular Biology.

Assistant Professor

Cockayne, Susan (1982) Ph.D., Brigham Young University, 1990. Medical Technology.

Graduate Programs and Degrees

Medical Technology (M.S.)

Microbiology (M.S.)

Microbiology (Ph.D.)

Areas of Emphasis

Immunology, molecular biology, physiology, virology, microbial ecology, genetics, antimicrobials, clinical microbiology.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements*

Admission and Entry

I. Application Requirements:

A. Deadlines: University deadlines apply. Decisions on financial aid will be made on March 1 for the subsequent year.

B. Entrance examination: General GRE (Q,V,A) required with recommended score of 1600.

II. Statement of intent must explicitly state field of interest and career goals.

Medical Technology (M.S.)

Admission and Entry: See above application requirements.

Prerequisite:

A. Baccalaureate degree.

B. Certification as medical technologist or clinical laboratory scientist.

Requirements for Degree

I. Credit hours (39): Minimum 39 hours of approved course work.

II. Two semesters as a teaching assistant.

III. Thesis: None required.

Microbiology (M.S.)

Admission and Entry: See above application requirements.

I. Prerequisite:

A. Baccalaureate degree in microbiology or equivalent discipline.

- B. One year of inorganic chemistry (including laboratory).
- C. One semester of quantitative analysis.
- D. One year of organic chemistry.
- E. One year of general physics at Phscs. 105 level or higher.
- F. One semester of calculus.
- G. Mcbio. 401, 402, 403, 404, or equivalent.
- II. Requirements for Degree
 - A. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Mcbio. 699R).
 - B. Required courses: Mcbio. 691R (attendance required each semester of residence), Chem. 581, 582, 584, Zool. 503.
 - C. Minor: Any approved minor in biological or physical science, although none is required.
 - D. Approved teaching experience of one semester.
 - E. Thesis: Standard university thesis or journal publication format.
 - F. Examination: Oral examination on thesis and course work.

Microbiology (Ph.D.)

Admission and Entry: See above application requirements.

Requirements for Degree

- I. Credit hours:
 - A. Candidates without a master's degree: 54 semester hours beyond baccalaureate including no more than 18 hours of dissertation credit.
 - B. Minimum of 36 hours beyond master's degree, including 18 hours of dissertation (Mcbio. 799R).
- II. Required courses: Chem. 461, 581, 582, 584; Mcbio. 691R (attendance required each semester of residence); Zool. 503.
- III. Minor: Any approved minor in biological or physical science, although none is required.
- IV. Two semesters of approved teaching experience.
- V. Written qualifying examination before selection of dissertation topic (may be waived if master's degree was obtained from BYU).
- VI. Skill requirement in foreign languages, computer science, or statistics.
- VII. Dissertation: Standard university dissertation format or journal publication format.
- VIII. Examinations:
 - A. Written and oral comprehensive examination on completion of skill requirement and all course work.
 - B. Oral defense of dissertation.

*Obtain a copy of the Graduate Student Handbook from the department office (775 WIDB).

Program and Degree Resources

See College of Biology and Agriculture section of this catalogue for statement on research facilities and projects.

Microbiology Graduate Courses

- 502. Immunobiology. (4)**
Prerequisite: Mcbio. 402 or equivalent.
Literature review of current topics in immunology.
- 503. Clinical Microbiology. (4)**
Prerequisite: Mcbio. 403 or equivalent.
Approaches to laboratory diagnosis of infectious diseases.
- 504. Molecular Biology of Animal Viruses. (4)**
Prerequisite: Mcbio. 404 or equivalent.
Molecular aspects of viral replication and infection.
- 521. Industrial Microbiology. (3)**
Prerequisite: Mcbio. 401 and biochemistry.
- 526. Molecular Genetics of Prokaryotes. (4)**
Prerequisite: Mcbio. 375, 401, Chem. 581.
Molecular basis of genetics of bacteria and bacteriophages, including mechanisms of DNA transfer, uptake, recombination, replication, and mutation.
- 541. Molecular Biology of the Gene. (3)**
Prerequisite: Mcbio. 375, 404, Chem. 351, 352.
Molecular biology of gene structures and expression in prokaryotic and eukaryotic organisms.
- 542. Molecular Biology Laboratory. (2)**
Laboratory to accompany Mcbio. 541.
- 551. Microbial Physiology. (5)**
Prerequisite: Mcbio. 401, Chem. 481.
- 561. Radioisotope Methods in Biomolecular Research. (3)**
Prerequisite: college physics and Mcbio. 502 or 504.
- 601. Molecular Approaches to Microbial Pathogenesis. (2)**
Prerequisite: Mcbio. 403.
Mechanisms of pathogenesis in host-parasite relationships.
- 611. Cellular Immunology and Immunogenetics. (2)**
Prerequisite: Mcbio. 502.
- 629. Advanced Clinical Laboratory Science. (3)**
Clinical techniques and their relationship to disease. Topics in hematology, microbiology, immunohematology, and clinical chemistry.
- 631. Molecular Mechanisms in Virology. (2)**
Prerequisite: Mcbio. 504; Chem. 581 or equivalent.
Selected topics in molecular functions of animal viruses.
- 632. Cell and Tissue Culture Techniques. (2) Even yr.**
Prerequisite: Mcbio. 504; Chem. 581 or equivalent.
Advanced procedures in cell culture.
- 642. Molecular Biology of the Cell. (2)**
Prerequisite: Mcbio. 541.
Structure and function of the prokaryotic and eukaryotic cells at the molecular level. Emphasis on molecular aspects of membranes, cytoskeleton, organelles, cell-to-cell communication, and cell movement.
- 651R. Special Topics in Microbiology. (1-2)**
- 652R. Special Topics in Clinical Laboratory Science. (1-2)**

671. Clinical Correlation. (2)

Correlating laboratory data with the diagnosis, pathogenesis, progress, and treatment of disease.

691R. Graduate Seminar. (1)

695R. Research. (Arr.)

699R. Master's Thesis. (1-9)

799R. Doctoral Dissertation. (1-9)

Music

Chair: K. Newell Dayley, C-550 HFAC, 378-3083

Graduate Coordinator: Glenn R. Williams, E-466 HFAC, 378-3317

Faculty/Specialties

Professors

- Barrus, Clyn D. (1985) D.M.A., University of Michigan, 1971. *Orchestral Conducting, String Performance/Pedagogy.*
- Belnap, Parley L. (1965) D.M.A., University of Colorado, 1975. *Organ Performance/Pedagogy.*
- Bradshaw, Merrill K. (1957) D.M.A., University of Illinois, 1962. *Theory/Composition.*
- Dalton, David J. (1963) D.M., Indiana University, Bloomington, 1970. *String Performance/Pedagogy.*
- Drinkall, Roger (1989) M.M., University of Illinois, 1962. *String Performance/Pedagogy.*
- Hatton, Gaylen A. (1979) Ph.D., University of Utah, 1964. *Theory/Composition, Brass Performance/Pedagogy.*
- Mason, James A., Dean (1957) Ed.D., Arizona State University, 1970. *Music Education.*
- Pollei, Paul C. (1963) Ph.D., Florida State University, 1975. *Piano Performance/Pedagogy.*
- Powley, E. Harrison (1969) Ph.D., University of Rochester, 1974. *Musicology.*
- Pratt, Rosalie Rebollo (1979) Ed.D., Columbia University, 1976. *Music Education.*
- Randall, David M. (1970) D.M.A., University of Iowa, 1970. *Woodwind Performance/Pedagogy.*
- Robison, Clayne W. (1973) D.M.A., University of Washington, 1973. *Vocal Performance/Pedagogy.*
- Sargent, David H. (1976) D.M.A., University of Illinois, 1975. *Theory/Composition.*
- Westwood, Shirley A. (1989) D.M.A., University of Missouri, Kansas City, 1980. *Vocal Performance/Pedagogy.*
- Williams, Glenn R. (1965) D.M.A., University of Rochester, 1961. *Woodwind Performance/Pedagogy.*

Associate Professors

- Bachelder, Daniel F. (1975) Ph.D., Brigham Young University, 1976. *Brass Performance/Pedagogy.*
- Blackinton, David P. (1980) D.M.A., Catholic University of America, 1975. *Band Conducting, Brass Performance/Pedagogy.*
- Bush, Douglas E. (1978) Ph.D., University of Texas, 1982. *Musicology.*
- Dayley, K. Newell (1970) D.A., University of Northern Colorado, 1986. *Brass Performance/Pedagogy.*
- Durham, Thomas L. (1978) Ph.D., University of Iowa, 1978. *Theory/Composition.*

Hopkin, J. Arden (1990) D.M.A., University of Rochester, 1978. *Voice Performance/Pedagogy.*

Jessop, Scott Gordon (1980) Ph.D., Brigham Young University, 1980. *Music Education.*

Kenney, Susan Hobson (1977) M.A., Brigham Young University, 1978. *Elementary Music Education.*

Smith, Raymond (1982) D.M., Indiana University, 1982. *Woodwind Performance/Pedagogy.*

Staheli, Ronald J. (1978) D.M.A., University of Southern California, 1977. *Choral Conducting.*

Stuart, Lila R. (1986) M.M., Indiana University, 1968. *Vocal Performance/Pedagogy.*

Wilberg, Mack J. (1984) D.M.A., University of Southern California, 1985. *Choral Conducting.*

Assistant Professors

- Anderson, Richard Paul (1972), D.M.A., University of Colorado, 1986. *Piano Pedagogy.*
- Elliott, Richard L. (1988) Ph.D., University of Rochester, 1989. *Organ Performance/Pedagogy.*
- Hicks, Michael D. (1986) D.M.A., University of Illinois, 1984. *Theory/Composition.*
- Johnson, Steven P. (1987) Ph.D., University of California, Los Angeles, 1989. *Musicology.*
- Peterson, Donald L. (1986) D.M.A., Arizona State University, 1986. *Music Education.*
- Shumway, Jeffrey L. (1985) D.M., Indiana University, 1982. *Piano Performance/Pedagogy.*
- Smith, Robert Bailly (1967) M.A., Brigham Young University, 1967. *Piano Performance/Pedagogy.*

Graduate Programs and Degrees

- Music Education (M.A.)
- Musicology (M.A.)
- Composition (M.M.)
- Music Education (M.M.)
- Performance and Pedagogy (M.M.)
- Musicology (Ph.D.)

Areas of Emphasis

See faculty specialties.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Please consult the current edition of the Department of Music Graduate Handbook for specific materials relating to application to a program.

Admission and Entry

Application requirements for all graduate music majors:

- A. Deadlines: March 1 for fall semester or summer term entrance and consideration for assistantships and financial awards for the following academic year.
- B. Entrance examination: GRE music subject test; score must be received before admission.

- C. Sample research paper: International students whose principal language is not English must submit a sample research paper that demonstrates adequate ability to write in English. This paper should be submitted to the Department of Music at the time completed application forms are submitted to Graduate Admissions.
- D. Graduate performance audition: For majors or minors in performance and pedagogy.
- E. Entry times: Fall semester only, except applicants for M.M. and M.A. in music education, who must enter summer term.

Music Education (M.A.)

Admission and Entry

- I. Application requirements: See preceding general requirements, but consult Department of Music Graduate Handbook for specific application and program requirements.
- II. Prerequisite: Baccalaureate degree in music or equivalent.

Requirements for Degree

- I. Credit hours: Minimum 26 course hours plus 6 thesis hours (Music 699R).
- II. Required courses:
 - A. Music 501, 699R; 4 hours from Music 671, 672, 673, 674, 675; Stat. 552.
 - B. Electives: 8–10 hours from graduate music courses and 7–9 hours from graduate courses outside the music field.
- III. Thesis.
- IV. Examinations:
 - A. Comprehensive examination.
 - B. Defense of thesis.

Musiology (M.A.)

Admission and Entry

- I. Application requirements: See preceding general requirements, but consult Department of Music Graduate Handbook for specific application and program requirements.
- II. Prerequisite: Baccalaureate degree in music or equivalent.

Requirements for Degree

- I. Credit hours: Minimum 26 course work hours plus 6 thesis hours (Music 699R).
- II. Required courses:
 - A. Music 500, 607A,B, 699R; any 12 hours from 601, 602, 603, 604, 605, 606.
 - B. Electives: 8 hours.
- III. Minor: Consult with department.
- IV. Thesis.
- V. Examinations:
 - A. Department language proficiency examination in French, German, or Latin.
 - B. Comprehensive examination.
 - C. Defense of thesis.

Composition (M.M.)

Admission and Entry

- I. Application requirements: See preceding general requirements, but consult Department of Music Graduate Handbook for specific application requirements.
- II. Prerequisite:
 - A. Baccalaureate degree in music composition or equivalent in previous training.
 - B. Portfolio of four works in various media and forms and a tape of two or more of these compositions.

Requirements for Degree

- I. Credit hours (32): Minimum 32 course work hours.
- II. Required courses: Music 500, 588, 606, 687R (6), 698A,B (4); 3 hours from 601, 602, 603, 604, 605; 6 hours from 581, 583, 591, 596, 683.
- III. Recital: Strongly recommended.
- IV. Project.
- V. Examination: Final oral examination and defense of project.

Music Education (M.M.)

Admission and Entry

- I. Application requirements: See preceding general requirements, but consult Department of Music Graduate Handbook for specific application requirements.
- II. Prerequisite: Public school music teacher certification.

Requirements for Degree

- I. Credit hours (32): Minimum 32 course work hours including a professional improvement project (Music 698A,B).
- II. Required courses: Music 501, 595, 673, 674, 675; 6 hours from 532R, 533R, 534R, 535R; 4 hours from 560R or 660R; 698A, B.
- III. Project.
- IV. Examination: Final oral examination and defense of project.

Performance and Pedagogy (M.M.)

Admission and Entry

- I. Application requirements: See preceding general requirements, but consult Department of Music Graduate Handbook for specific application requirements.
- II. Prerequisite:
 - A. Baccalaureate degree in performance or pedagogy or equivalent.
 - B. Entrance performance audition.
 - C. Music 292 or equivalent for choral conducting candidates.
 - D. Proficiency in German, French, and Italian diction for voice candidates.

Requirements for Degree

- I. Credit hours (32): Minimum 32 course work hours.
- II. Required courses:
 - A. Music 500, 660R (4 hours), ensemble (2 hours).

- B. Voice or orchestral instrument specialty: Music 505, 665, 670R (2 hours), 694R in applied literature (2 hours), 697A, B (4 hours) or 649R (2 hours), and electives in addition to item III below (5–7 hours).
 - C. Keyboard instrument specialty: Music 505, 591, 665, 670R (2 hours), 694R in applied literature (2 hours), 697A, B (4 hours) or 649R (2 hours), and electives in addition to item III below (3–5 hours). The ensemble requirement in item A above includes 644R.
 - D. Choral music specialty: Music 506A,B, 533R (4 hours), 664, 697A,B, and electives in addition to item III below (6 hours).
- III. Electives: 6 hours in nonperformance music graduate courses (as approved by advisory committee) from one or more of the following areas: music education, music history, or music theory.
- IV. Examinations:
- A. Jury examination each semester of enrollment in 660R.
 - B. Repertory examination.
 - C. Final oral examination.
- V. Closure project: The 697A,B sequence is the recommended closure project for the degree. With approval from the advisory committee, a student may select the solo recital (649R) option.

Musicology (Ph.D.)

Admission and Entry

- I. Application requirements: See preceding general requirements, but consult Department of Music Graduate Handbook for specific application requirements.
- II. Prerequisite: Baccalaureate degree in music; master's degree in musicology or equivalent.

Requirements for Degree

- I. Credit hours (86 beyond baccalaureate, 56–58 beyond master's): Minimum of 68 course work hours beyond the baccalaureate degree or 38–40 hours beyond the master's degree (subject to approval by the advisory committee), plus 18 dissertation hours (Music 799R).
- II. Required courses: Music 500, 596, 601, 602, 603, 604, 605, 606, 608A,B, 699R (thesis, 6 hours), 701A,B, 799R (dissertation, 18 hours).
- III. 8 hours from a single cognate field outside the Department of Music (e.g., linguistics, philosophy, German literature, etc.).
- IV. Language requirement: Pass departmental examinations in French, German, and Latin (additional languages may be required by advisory committee if necessary for candidate's research).
- V. Dissertation.
- VI. Examinations:
 - A. Comprehensive examination.
 - B. Oral defense of dissertation.

Music Graduate Courses

- 500. Musical Research Techniques.** (2)
Prerequisite: graduate standing.
- 501. Music Education Research Techniques.** (2)
Prerequisite: graduate standing.
- 503. Aesthetics.** (3) On dem.
Fundamental questions of aesthetic theory as they have been treated from classical antiquity to the present, emphasizing musical aesthetics.
- 505. Applied Literature.** (2) On dem.
Prerequisite: completion of Music 406 or equivalent.
Continuation of Music 406.
- 506A. Choral Literature 1.** (2)
Prerequisite: consent of instructor.
Concentrated study of choral literature through analysis and application.
- 506B. Choral Literature 2.** (2)
Prerequisite: consent of instructor.
Continuation of Music 506A.
- 532R. Score Preparation and Conducting: Band.** (2)
- 533R. Score Preparation and Conducting: Choral.** (2)
- 534R. Score Preparation and Direction: Jazz.** (2)
- 535R. Score Preparation and Conducting: Orchestra.** (2)
- 560R. Performance Instruction: Minor.** (2)
Prerequisite: music major status; completion of undergraduate performance instruction; secondary instrument.
Graduate performance instruction for those not majoring in performance or pedagogy. \$175 fee.
- 570. Music for Elementary School Teachers.** (2) On dem.
Prerequisite: Music 371, 471, or elementary music teaching experience.
Experiences in teaching various music activities in the elementary school.
- 571. Elementary Education Music Pedagogy.** (2) On dem.
Prerequisite: Music 371 and equivalent of elementary education teaching minor in music.
Orff, Dalcroze, and Kodaly materials and techniques.
- 575R. Summer Music Workshops and Clinics.** (1–2)
- 576. Fundamentals and Techniques of the Marching Band.** (2) On dem.
Prerequisite: Music 294, 296. For music education majors only.
Planning, charting, and scoring for marching bands.
- 581. Twentieth-Century Orchestration.** (3)
Prerequisite: Music 481.
New techniques for standard and new instruments; graphic scores; analysis and listening.
- 583. Sixteenth-Century Counterpoint.** (3)
Prerequisite: Music 483.
Strict modal counterpoint in sixteenth-century style (Palestrina); includes species, text setting, and motet.
- 588. Seminar in the Compositional Process.** (3) On dem.
The creative process for composers, performers, and listeners.

591. Advanced Topics in Keyboard Harmony. (2) On dem.

Prerequisite: Music 407.

Topics vary.

595. Score Analysis. (2)

Analysis of representative choral and instrumental works from the Renaissance through contemporary styles.

596. Schenker Analysis. (3) On dem.

Prerequisite: Music 395 or equivalent.

Heinrich Schenker's tonal analysis system: concepts and skills.

599R. Cooperative Education. (1-6)

Prerequisite: consent of instructor.

Internship in creative, performing, producing, or teaching applications of major course work.

600R. Topics in Music. (1-3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

601. Music in the Middle Ages. (3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

602. Music in the Renaissance. (3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

603. Music in the Baroque Era. (3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

604. Music in the Classic Period. (3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

605. Music in the Romantic Period. (3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

606. Music of the Contemporary Period. (3)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

607A. Seminar in Musicology. (2)

Prerequisite: Music 301, 302, 303, 304, or equivalent.

607B. Seminar in Musicology. (2)

Prerequisite: Music 607A.

608A. History of Notation and Paleography 1. (3)

Prerequisite: Music 301, 302, 303, 304, 601, or equivalent.

Notation from the early Christian chant to approximately 1400.

608B. History of Notation and Paleography 2. (3)

Prerequisite: Music 608A.

Offered same year as Music 608A. Notation from approximately 1400 to 1625, including tablatures.

614R. Concert Choir. (1)

615R. University Singers. (1)

619R. Music Theatre Performance. (1)

626R. Wind Symphony. (1)

634R. Synthesis. (1)

638R. Philharmonic Orchestra. (1)

639R. Chamber Orchestra. (1)

641R. Brass Chamber Music. (1)

642R. Early Music Ensemble. (1)

643R. Guitar Ensemble. (1)

644R. Keyboard Ensemble. (1)

645R. Percussion Ensemble. (1)

646R. String Chamber Music. (1)

647R. Vocal Chamber Music. (1)

648R. Woodwind Chamber Music. (1)

649R. Solo Recital. (2)

Prerequisite: concurrent registration in Music 660R. Recital fee in addition to private lessons.

660R. Performance Instruction: Major. (2)

Prerequisite: completion of undergraduate performance proficiency requirements and audition; primary instrument. \$175 fee.

664. Choral Development. (2)

Prerequisite: instructor approval.

Conducting and teaching skills as principles of choral artistry are studied.

665. Pedagogy. (2) On dem.

Prerequisite: completion of appropriate undergraduate pedagogy courses or equivalent.

Advanced pedagogical studies and supervised private and group instruction.

670R. Supervised Teaching. (1-3)

Prerequisite: Music 665 and consent of instructor.

671. Influence of Music on Behavior. (2)

Variables that influence musical behavior and effects of music on nonmusical behavior.

672. Psychology of Music. (2) On dem.

Psychoacoustical properties of musical phenomena and the neurological aspects of music perception and performance.

673. Historical and Social Foundations of Music Education. (2)

Leaders, events, and trends in history of music education, emphasizing sociological implications.

674. Philosophical and Aesthetic Foundations of Music Education. (2)

Questions related to teaching music in the public schools.

675. Theories of Music Learning and Motivation. (2)

Applications of psychology to teaching and learning of music. Research paper required.

679R. Special Lectures in Music Education. (1-5)

Prerequisite: certification in music plus teaching experience.

683. Twentieth-Century Counterpoint. (3) On dem.

Prerequisite: Music 583.

Linear counterpoint in dissonant contexts, using such works as Hindemith's *Ludus Tonalis*, Bartok's *Mikrokosmos*, and Crumb's *Makrokosmos* as models.

684. Advanced Fugue. (3) On dem.

Prerequisite: Music 483.

Fugues in Bach's *Well-tempered Clavier* and other exemplary works.

687R. Composition. (3)

Prerequisite: Music 588 or equivalent.

688R. Composition for Master's Degree. (1-6)

Prerequisite: approval of the Music Department graduate faculty, based on evidence of ability in composition manifested in preliminary work.

694R. Independent Readings. (1-3)

Prerequisite: approval of advisory committee.

697A. Scholarly Paper for Master of Music Degree. (2)

Preparation of formal paper related to music of graduate recital. Supervised by musicology area and graduate advisor.

697B. Recital. (2)

Prerequisite: Music 697A and approval of advisory committee and graduate music faculty.

698A. Master's Project—Professional Improvement Project. (2)

Identifying and delineating a project. Study list constructed and advisor assigned.

698B. Master's Project—Professional Improvement Project. (2)

Presentation of project and written report.

699R. Master's Thesis. (1-9)

Prerequisite: approval of department graduate faculty.

700R. Seminar in Music. (1-3) On dem.

Prerequisite: Music 500 or 501 or equivalent and approval of graduate advisory committee.

701A. History of Music Theory 1. (3) On dem.

Prerequisite: Music 301, 302, 303, 304, or equivalent.

Content and system of music theory from classical antiquity through works of Zarlineo.

701B. History of Music Theory 2. (3) On dem.

Prerequisite: Music 701A.

Continuation of Music 701A from works of Rousseau and Rameau through contemporary theoretical systems.

799R. Doctoral Dissertation. (1-9)

Prerequisite: approval of department graduate faculty.

Nursing

Faculty/Specialties

Professors

Isaacs, Patricia C. (1977) Ed.D., Brigham Young University, 1988. Biophysical: Feeding Regimens in Infants and Children, Growth and Development.

Leifson, June (1971) Ph.D., Brigham Young University, 1979. Cultural Environmental: Community Assessment, Handicapped Children, Family.

Overfield, Theresa (1978) Ph.D., University of Colorado, 1975. Biophysical: Health Research Methodology.

Wood, Camilla S. (1973) Ph.D., University of Utah, 1972. Biophysical: Physiology, Nutritional, and Infant Growth, Milk Studies, Immunology.

Associate Professors

Jensen, Marian (1970) M.S., Brigham Young University, 1979. Biophysical: Human Milk Energy, Stress in Mothers of Preschoolers.

Lyons, Marilyn (1966) D.N.Sc., Rush University, 1983. Biophysical: Immunology, Alzheimer's Disease, Neurology, Neurosurgery.

Murphy, Millene (1985) Ph.D., Brigham Young University, 1982. Psychosocial: Neuropsychology, Cognitive Function in Relation to Development, Alzheimer's Disease.

Riddle, Lana B. (1971) Ph.D., Texas Woman's University, 1984. Biophysical: Capsular Contracture in Mammoplasty, Clinical Problems.

Assistant Professors

Forrest, JoAnn P. (1983) M.S., University of Utah, 1970. Psychosocial: Attitudes and Anxieties of Death and Dying, Child and Adolescent Psychology.

Rogers, Sandra (1980) D.N.Sc., University of California, San Francisco, 1989. Cultural Environmental: Primary Health Care, International Health.

Sorensen, Elaine S. (1987) Ph.D., University of Utah, 1987. Cultural/Environmental, Children and Stress, AIDS.

Williams, Mary (1978) M.S., University of Utah, 1979. Psychosocial: Transplant Anxiety, Management, Qualitative Methodology.

Graduate Program and Degree Nursing (M.S.)

Areas of Emphasis

Advanced practice (family and pediatric), nursing administration.

The master of science degree program emphasizes clinical expertise and includes graduate-level nursing theories and concepts as well as extensive clinical experience. Research is an important component of the program. Students are required to write a thesis or, with special permission, develop an innovative project.

The graduate program has four major goals: (1) to prepare expert clinicians in a nursing specialty; (2) to prepare leaders who implement changes in health care; (3) to prepare nurses who conduct research for solutions to clinical, educational, or administrative problems; and (4) to prepare nurses for doctoral study.

Students may take courses to prepare them to be administrators, educators, and practitioners.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Nursing (M.S.)

Admission and Entry

I. Application requirements:

- A. Deadlines: University deadlines apply.
- B. Three letters of recommendation from former teachers or employers.
- C. Prepared statement of personal purposes and goals for graduate education.

- D. GPA: Minimum GPA of 3.0 for last 60 hours.
- II. Prerequisite:
- A. Baccalaureate degree in nursing from an NLN-accredited program. Graduates from state-accredited programs will be admitted on demonstration of professional proficiency equivalent to that of students from NLN-accredited programs.
 - B. Current R.N. licensure in the state of Utah.
 - C. Knowledge of physical assessment skills for advanced practice applicants.
 - D. Completion of basic statistics course.
- III. Entry times: Fall and winter semesters only.
- IV. Access to automobile: Candidates may be required to attend courses offered only in Salt Lake City to gain experience in a variety of hospitals and clinics and to visit agencies and client homes; therefore, access to a car is necessary.
- V. Student malpractice: Candidates are required to carry student liability insurance. The fee is \$4 per semester, to be paid at the time of registration.

Requirements for Degree

- I. Credit hours (36): Minimum 30 course work hours plus 6 thesis or project hours (Nurs. 699R or 698R).
- II. Required courses: Nurs. 511, 515, 517; 699R or 698R.
 - A. Advanced practice: Above courses plus Nurs. 502, 504 524, 598R.
 - B. Nursing Administration: above plus 514, 518, 598R, and cognates.
- III. Electives: Determined in consultation with advisory committee.
- IV. Thesis: Thesis or project.
- V. Examination: Oral defense of thesis or project.

Program and Degree Resources

Comprehensive Clinic

Physiology Laboratory

Nursing Graduate Courses

- 502. Physical Assessment and Management.** (4)
Prerequisite: basic physical assessment course, concurrent registration in Nurs. 598R for 3 credit hours. Recommended: recent physiology course.
Advanced principles and practice of biophysical assessment. Pathophysiology and management of common disorders.
- 504. Psychosocial Assessment and Management.** (3)
Prerequisite: concurrent registration in Nurs. 598R for 1 credit hour.
Evaluation of psychosocial status, including assessment, diagnosis, intervention, and referral.
- 506. Biochemical Disorders.** (3)
Clinical chemistry related to pathology and nursing intervention.
- 508. Pharmacological Management.** (2)
Clinical pharmacology, principles of drug therapy, drug therapy monitoring.

510R. Special Programs and Projects. (1-4)

Prerequisite: consent of instructor.

511. Professional Issues and Roles. (2)

Professional nursing and organizational issues related to nursing roles.

514. Administrative Theories. (3)

Administrative theories related to interpersonal relationships, organizational behavior, and nursing management.

515. Nursing Theories. (2)

Analysis and critique of theoretical and conceptual bases of nursing frameworks; for use in practice, research, and education.

516. Teaching and Evaluation in Nursing. (3)

Instructional strategies and evaluation methods for classroom, laboratory, and clinical teaching in nursing.

517. Nursing Research Design. (3)

Prerequisite: Nurs. 515, and any statistics course except biostatistics or epidemiology.

Development of a research proposal.

518. Nurse Administrator Role. (3)

Prerequisite: Nurs. 514.

Organizational structure, standards, budgeting, cost containment, quality assurance, risk management, health care needs.

519. Management of Clients with Acute Health Problems. (2)

Prerequisite: Nurs. 502, 504, concurrent registration in 598R, consent of instructor, and basic life support certification. Additional fee required for advanced life support certification.

Instruction and clinical experience in management of clients with acute health problems.

520. Promotion of Women's Health. (4-6)

Prerequisite: Nurs. 502, 504.

Nursing management of the client with obstetric/gynecological concerns. Includes clinical practice.

521. Promotion of Child Health. (4-6)

Prerequisite: Nurs. 502.

Principles in the assessment and management of infants, children, and adolescents with a variety of health care problems. Includes clinical practice.

522. Promotion of Health for the Elderly. (4-6)

Prerequisite: Nurs. 502, 504.

Nursing management of the elderly client. Includes clinical practice.

524. Theories in Family Nursing. (2)

Family theories and application to nursing practice.

545. Pathophysiology of Medical-Surgical Problems. (2)

Prerequisite: Nurs. 502 and concurrent registration in 598R.

Correlation of concepts in medical-surgical nursing related to organ pathology.

546R. Medical-Surgical Specialties. (3)

Prerequisite: Nurs. 502 and concurrent registration in 598R.

Correlation of theories and concepts in medical-surgical nursing related to specialty areas: neurological, cardiovascular.

556. Psychiatric Nursing Interventions. (3)

Prerequisite: Nurs. 502, 504 and concurrent registration in 598R.

Selected theoretical approaches to understanding human behavior and psychiatric disorders along with related psychiatric nursing interventions.

558. Psychiatric Nursing/Family and Group Counseling. (3)

Prerequisite: Nurs. 502, 504, and concurrent registration in 598R.

Relationship of group and family theories to psychiatric nursing interventions.

560. Theory in Child Nursing. (2)

Child nursing theory and concepts in growth and development, culture, and psychosocial interactions.

567. Child Nursing Assessment and Management in Acute Care. (4-6)

Theory, assessment, and acute care management of children of all ages. Includes clinical practice.

573. Health Care Delivery Systems. (3)

Health care delivery systems on international, national, state, and community levels; focuses on nurse's role; 1 hour clinical practice.

590R. Independent Study. (1-4)

Prerequisite: consent of instructor.
Individualized study.

595R. Special Topics (1-3)

Prerequisite: consent of instructor.
—Medical/Surgical Nursing
—Biological Variations
—Psychiatric Nursing

598R. Nursing Practicum. (1-4)

Prerequisite: consent of instructor.

Practicum for role development as nurse specialist, administrator, practitioner, or educator in nursing specialty.

698R. Project. (1-6)

Prerequisite: consent of committee.
Master's project.

699R. Master's Thesis. (1-6)

Prerequisite: Nurs. 517 and consent of committee.

Philosophy

Chair: James E. Faulconer, 3196 JKHB, 378-6519

The Department of Philosophy offers a graduate minor but not a graduate major. See the BYU General Catalogue for faculty listings.

Graduate Program

Philosophy Minor

Philosophy students study significant texts and analyze issues in diverse disciplines and in doing so gain basic habits of mind needed for mature and responsible judgment.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program Requirements

Philosophy Minor

- I. Master's level: An approved 9 hours.
- II. Doctoral level: An approved 15 hours.
- III. Students should direct inquiries about courses and advisory committee members to the department chair.

Philosophy Graduate Course

501R. Graduate Seminar. (2-5)

Prerequisite: consent of instructor.

Selected topic, figure, or movement in philosophy, as announced in Class Schedule.

Physical Education—Dance

Chair: Phyllis C. Jacobson, 296 RB, 378-5087

Faculty/Specialties

Professor

Jacobson, Phyllis C. (1957) Ph.D., University of Utah, Administration, Dance Education, Physical Fitness.

Associate Professors

Black, Catherine H. (1972) M.F.A., University of Utah, 1972. Dance History, Modern Dance, Choreography, Performance.

Davis, Susanne Johnson (1974) M.S., Brigham Young University, 1971. Folk Dance, Cultural Aspects, Pedagogy.

Debenham, Hadd Patrick (1976) M.A., University of California, Los Angeles, 1976. Modern Dance, Choreography, Technique, Performance, Musical Dance Theatre.

Ditson, Leslie Allen (1982) M.A., University of California, Los Angeles, 1970. Kinesiology, Modern Dance, Improvisation, Theatre Craft, Movement Analysis.

Gibb, Sara Lee (1965) M.S., Brigham Young University, 1970. Modern Dance, Dance Education, Pedagogy, History.

Assistant Professors

Allen, Sandra Birch (1969) M.F.A., University of Utah, 1967. Ballet, Methodology, Technique, History.

Lyman, Emerson S. (1973) Ed.S., University of Utah, 1972. Ballroom Dance.

Prohosky, Caroline (1986) M.A., University of California, Los Angeles, 1980. Modern Dance, Choreography, Technique, Performance.

Graduate Program and Degree

Dance (M.A.)

Areas of Emphasis

Choreography, performance, pedagogy, research.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Dance (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: General GRE, scores subject to review.
 - C. GPA: Minimum of 3.0 for the last 60 hours of undergraduate work.
- II. Prerequisite: Baccalaureate degree in dance with knowledge and competency equivalent to that required in the undergraduate program at Brigham Young University; applicants will be required to satisfy deficiencies.
- III. Audition: Applicants must audition in person or submit a videotape (or other suitable documentation) demonstrating proficiency in one or more of the following areas: choreography, performance, pedagogy, or research.

Requirements for Degree

- I. Choreography/Performance emphasis
 - A. Project/Thesis option:
 1. Credit hours (30): Minimum 24 course work hours plus 6 project or thesis hours (PE—D 698R or 699R).
 2. Required courses (15 hours): PE—D 540R or 630R (4 hours), 601 (1 hour), 610 (3 hours), 640 through 653 (3 hours), 660 through 663 (4 hours).
 3. Dance electives (5 hours): Selected from PE—D 500R, 540R, 555, 562R, 563R, 599R, 630R, 638R, 640 through 653, 660 through 663, 695R, 697R.
 4. Electives (4 hours): Selected from graduate courses in any college. For example, anthropology, art, humanities, music, physical education—dance or sports, theatre, or other graduate programs as determined in consultation with advisory committee.
 5. Completion of at least one advanced ballet or modern technique class during each semester of enrollment (may or may not be part of required or elective courses).
 6. Successful periodic reviews of progress.
 7. Formal presentation and documentation of student choreography and/or performance.
 8. Project or thesis: Includes written and oral presentation of three-chapter thesis or project prospectus.
 9. Examinations:
 - a. Comprehensive oral examination on course work.
 - b. Oral defense of project or thesis.
 - B. Course work option: Not available.
- II. Pedagogy/Research emphasis
 - A. Project/Thesis option:
 1. Credit hours (30): Minimum 24 course work hours plus 6 project or thesis hours (PE—D 698R or 699R).

2. Required courses (15 hours): PE—D 540R or 630R (4 hours), 601 (1 hour), 610 (3 hours), 640 through 653 (3 hours), 660 through 663 (4 hours). (Pedagogy emphasis must take 651.)
 3. Dance electives (5 hours): Selected from PE—D 500R, 540R, 555, 562R, 563R, 599R, 630R, 638R, 640 through 653, 660 through 663, 695R, 697R.
 4. Electives (4 hours): Selected from graduate courses in any college. For example, anthropology, art, humanities, music, physical education—dance or sports, theatre, or other graduate programs as determined in consultation with advisory committee.
 5. Successful periodic reviews of progress.
 6. Formal written thesis or documentation of project.
 7. Project or thesis: Includes written and oral presentation of three-chapter thesis or project prospectus.
 8. Examinations:
 - a. Comprehensive oral examination on course work.
 - b. Oral defense of project or thesis.
- B. Course work option:
 1. Credit hours (36): Minimum 36 course work hours.
 2. Required courses (15 hours): PE—D 540R or 630R (4 hours), 601 (1 hour), 610 (3 hours), 640 through 653 (3 hours), 660 through 663 (4 hours). (Pedagogy emphasis must take 651.)
 3. Dance electives (5 hours): Selected from PE—D 500R, 540R, 555, 562R, 563R, 599R, 630R, 638R, 640 through 653, 660 through 663, 695R, 697R.
 4. Electives (6 hours): Selected from graduate courses in any college. For example, anthropology, art, humanities, music, physical education—dance or sports, theatre, or other graduate programs as determined in consultation with advisory committee.
 5. Support area (10 hours): Aggregate of graduate nondance courses forming a supplementary, specialized area of study. The first 10 hours of any minor may be used to satisfy this requirement.
 6. Successful periodic reviews of progress.
 7. Examination: Comprehensive oral examination on course work.

Physical Education—Dance Graduate Courses

500R. Workshop in Dance. (1-3)

Experience with Workshop in Dance: aerobic, ballet, ballroom, folk, modern.

540R. Modern Dance Technique and Theory 5. (2)

Advanced technique, with combinations of movement and pattern to further dance as a performing art.

555. Dance Production, Advanced. (2) Even yr.

Prerequisite: PE—D 355 or equivalent.

Advanced techniques of producing dance programs for stage and TV.

562R. Modern Dance Composition, Advanced. (1) Odd yr.

Prerequisite: consent of instructor.

Composition, including elements of space, motion, energy, and time.

563R. Modern Dance Improvisation, Advanced. (1)

599R. Cooperative Education: Dance Practicum. (1–6)

Field experience for teaching and performance in dance.

601. Introduction to Graduate Studies in Dance. (1)

Prerequisite: acceptance into graduate program. •

Evaluation of aptitudes, leadership qualities, and ability to successfully complete a dance graduate program.

610. Research Methods in Dance. (3)

Designing, analyzing, and reporting on dance research. Topic selection, applicable dance research methods, interpreting, and critiquing dance research. Preparation of M.A. thesis prospectus.

630R. Dance Technique, Advanced. (1–2)

Prerequisite: audition.

Course designed for higher-level assignment and credit while attending ballet, ballroom, folk, or modern advanced technique course.

638R. Dance Performance. (1–2)

Prerequisite: audition.

Performing with a BYU dance company.

640. Creativity. (1) Even yr.

Relationship of creativity to the discipline of dance.

641. Cultural Aspects of Dance. (1) Odd yr.

Cultural influences upon dance.

642. Current Trends in Dance. (1) Even yr.

643. Dance Aesthetics. (1) Odd yr.

Aesthetic principles and concepts as they relate specifically to dance as an art form.

650. Dance Criticism. (2) Even yr.

Exploration of critical writing about dance.

651. Dance Pedagogy. (2) Odd yr.

Prerequisite: undergraduate course in dance methodology or equivalent.

Nature and application of pedagogy from universal and dance perspectives.

652. Study of Dance Therapies. (2) Even yr.

Concepts of and approaches to dance therapy for well and disabled populations.

653. Movement Analysis Systems. (2) Odd yr.

Movement; emphasis upon qualification to facilitate qualitative aspects of dance.

660. Dance Composition—Theory and Principles. (2) Odd yr.

Scholarly research in dance composition.

661. Dance Improvisation—Theory and Principles. (2) Even yr.

Research in dance improvisation.

662. Dance Performance—Theory and Principles. (2) Even yr.

Research in dance performance.

663. Dance Technique—Theory and Principles. (2) Odd yr.

Research in dance technique.

695R. Dance and Related Fine Arts. (1–4)

Interdisciplinary study integrating dance with art, literature, music, and theatre.

697R. Individual Research and Composition in Dance. (1–4)

Prerequisite: matriculation for graduate study in dance.

Pedagogical research, choreographic, or performance project (faculty approved and supervised). Presentation of resultant product required.

698R. Master's Project. (1–6)

699R. Master's Thesis. (1–6)

Physical Education—Sports

Chair: Boyd O. Jarman, 221-F RB, 378-6507

Graduate Coordinator: Joyce M. Harrison, 221-B RB, 378-3450

Faculty/Specialties

Professors

Allsen, Philip Edmond (1966) Ed.D., University of Utah, 1965. Exercise Physiology, Physical Fitness.

Conlee, Robert K. (1977) Ph.D., University of Iowa, 1975. Exercise Physiology.

Fisher, A. Garth (1969) Ph.D., University of New Mexico, 1969. Exercise Physiology.

Harrison, Joyce M. (1969) Ed.D., Brigham Young University, 1973. Curriculum and Instructional Design.

Jarman, Boyd O. (1969) Ed.D., University of Oregon, 1965. Administration and Supervision, Legal Liability.

Jensen, Clayne R. (1964) Ed.D., Indiana University, Bloomington, 1963. Kinesiology, Measurement and Statistics, Administration.

McGown, Carl M. (1972) Ph.D., University of Oregon, 1971. Motor Learning.

Roundy, Elmo S. (1963) Ed.D., University of California, Los Angeles, 1965. Measurement and Evaluation in Exercise Science.

Associate Professors

Barker, Ruel M. (1971) Ed.D., Brigham Young University, 1971. Elementary Physical Education, History of Physical Education.

Blakemore, Connie L. (1978) Ed.D., Temple University, 1984. Sport Pedagogy, Teacher Supervision.

Clarke, Mark S. (1982) Ed.D., Brigham Young University, 1971. Elementary Physical Education, Motor Development.

Cryer, Walter (1964) Ed.D., Brigham Young University, 1975. Biomechanics.

Durrant, Earlene (1973) Ed.D., Brigham Young University, 1975. Sports Medicine.

Hall, Larry Thomas (1978) Ph.D., University of Utah, 1976. Motor Learning.

Jones, J. Richard (1961) Ed.D., University of Northern Colorado, 1967. Sport Pedagogy, History and Philosophy of Physical Education.

- Leishman, Courtney M. (1962) Ed.D., Brigham Young University, 1976. Athletic Administration.
- Lewis, Kathryn (1972) Ed.D., Brigham Young University, 1978. Kinesiology, Biomechanics, Physical Education Administration.
- Poole, R. Craig (1980) Ed.D., University of Utah, 1970. Sport Psychology.
- Silvester, L. Jay (1969) Ed.D., Brigham Young University, 1976. Physical Fitness and Health Promotion.
- Tucker, Larry A. (1988) Ph.D., Southern Illinois University, 1981. Health Promotion, Research Methods.
- Vickers, Betty J. (1971) Ed.D., Brigham Young University, 1976. History and Philosophy of Physical Education.

Assistant Professor

- Chamberlain, Diane (1969) Ed.D., University of Utah, 1984. Sociology of Sport, Elementary Physical Education.

Graduate Programs and Degrees

Physical Education (M.Ed.)

Exercise Science and Athletic Training (M.S.)

Physical Education Administration, Curriculum, and Instruction (Ed.D.)

Corrective Physical Education and Rehabilitation (Ph.D.)

Exercise Physiology (Ph.D.)

The Department of Physical Education—Sports has the following graduate program objectives:

1. To provide a scholarly approach to physical education through careful research and rigorous intellectual inquiry.
2. To develop and train qualified professionals in physical education.
3. To develop scholars in physical education who can extend the body of knowledge.

Areas of Emphasis

Athletic training, corrective physical education and rehabilitation, curriculum and instruction, exercise physiology, exercise science, fitness and health promotion. Additional individual emphases are available at the master's level.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Note: Students planning to pursue the Ed.D. or Ph.D. degree in the Department of Physical Education—Sports at BYU must earn at least one of the prerequisite degrees at another university.

Physical Education (M.Ed.)

The M.Ed. degree is a 36-hour course work program designed specifically for teachers and coaches who do not wish to engage in a research study as part of the master's degree program.

The M.Ed. degree program is generally considered to be a terminal degree. A student completing this degree who wishes to go on for a doctorate will be required to write a thesis before writing a dissertation.

Admission and Entry

- I. Application requirements:

- A. Deadlines: University deadlines apply.
- B. Entrance examination: General GRE; recommended score of 1380.
- C. GPA: Minimum of 3.0 for last 60 semester hours of course work.
- D. Statement of intent that includes the following:
 1. Applicant's preparation and background for the program.
 2. Special emphasis applicant desires to pursue.
 3. Basic reasons for applicant's career choice.
 4. Applicant's special qualities and talents that would enhance success.
 5. Professional goals.
 6. Particular reasons for applying to BYU.
 7. Specific duration for accomplishing graduate degree.
 8. Any specific circumstances or objectives applicant wishes to be considered (optional).

- II. Prerequisite:

- A. Baccalaureate degree in physical education or a related field, including courses in motor learning, kinesiology, exercise physiology, and corrective physical education or athletic training.
- B. Demonstrated competence in writing, fitness, sport and/or dance skills, and computer use.

- III. Entry times: Fall semester and summer term only.

Requirements for Degree

- I. Credit hours (36): Minimum 36 course work hours.
- II. Required courses: PE—S 568, 630, 631, 649, 651, 652, 654, 655, 656, 657, 658, 659, 662, 691.
- III. Electives: 3 hours, including at least two courses in an area of interest. Undergraduate courses in the department may not apply toward a graduate degree. Workshops or coaching clinics will not apply.
- IV. Minor: None required.
- V. Examination: Comprehensive examination.

Exercise Science and Athletic Training (M.S.)

Candidates who have a scholarly interest in the scientific or historical aspects of physical education are encouraged to pursue this degree.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University deadlines apply.
 - B. Entrance examination: General GRE; recommended score of 1380.
 - C. GPA: Minimum of 3.0 for last 60 semester hours.
 - D. Statement of intent: See description under (M.Ed.) requirements above.
- II. Prerequisite: See description under (M.Ed.). Also, FSN 115 and PE—S 458 or equivalent.
- III. Entry times: Fall semester and summer term only.

Requirements for Degree

- I. Credit hours (30–36): Minimum 30 course work hours plus 6 thesis hours (PE—S 699R).
- II. Required courses:

- A. Fitness and health promotion option (36): PE—S 599R (6 hours), 630, 631, 661, 666, 667, 669, 691, 699R (6 hours); Hlth. 561; 3 elective hours from PE—S 561, 568, 620, 621, or Hlth. 463.
- B. Athletic training option (35): PE—S 561, 568, 620, 621, 622, 624, 630, 631, 666, 667, 691, 693R, 699R (6 hours).
- C. Individual specialization option (30): PE—S 630, 631, 666, 667, 691, 699R (6 hours); 13 elective hours selected in consultation with advisory committee. Hist. 200 is required for students writing a historical study (credit is not counted toward the degree). An internship may be taken in addition to the above requirements.

III. Minor: None required.

IV. Thesis.

V. Examination: Oral defense of thesis and examination of course work.

Physical Education Administration, Curriculum, and Instruction (Ed.D.)

Admission and Entry

I. Application requirements:

- A. Deadlines: University deadlines apply.
- B. Entrance examination: General GRE; recommended score of 1530.
- C. GPA: Minimum of 3.5 for last 60 hours of course work.
- D. Statement of intent that includes the following:
 1. Applicant's preparation and background for the program.
 2. Special emphasis applicant desires to pursue.
 3. Basic reasons for applicant's career choice.
 4. Applicant's special qualities and talents that would enhance success.
 5. Professional goals.
 6. Particular reasons for applying to BYU.
 7. Specific duration for accomplishing graduate degree.
 8. Any specific circumstances or objectives applicant wishes to be considered (optional).

II. Prerequisite:

- A. Master's degree in physical education or equivalent.
- B. Demonstrated competence in writing, speaking, fitness, sport and/or dance skills, and computer use.
- C. Two years of successful professional experience.
- D. PE—S 797R for candidates who have not written a thesis. These candidates must produce a publishable research manuscript before beginning work on a dissertation. (This is a prerequisite and will not count toward the 85 hours.)

III. Entry times: Fall semester and summer term only.

Requirements for Degree

- I. Credit hours (85): Minimum 85 hours beyond baccalaureate degree (at least 37 of which must be at BYU), including 6–9 internship hours (PE—S 599R), plus 12 dissertation hours (799R).

II. Required core courses: PE—S 568, 630, 654, 655, 656, 657, 659, 662, 691, 693R; Stat. 501, 502; computer literacy.

III. Required courses: PE—S 649, 650, 651, 652, 658, 751R, 755; EPsy. 620 or EPsy. 601; 20 hours of supporting course work (12 hours must be outside the Department of Physical Education—Sports). A majority of the work must be taken at BYU.

IV. Minor: Organizational behavior or educational psychology.

V. Dissertation.

VI. Examinations:

- A. Comprehensive examination.
- B. Oral defense of dissertation.

Exercise Physiology (Ph.D.)

Corrective Physical Education and Rehabilitation (Ph.D.)

Admission and Entry

I. Application requirements:

- A. Deadlines: University deadlines apply.
- B. Entrance examination: General GRE; recommended score of 1530.
- C. GPA: Minimum of 3.5 for last 60 hours.
- D. Statement of intent: See description under (Ed.D.).

II. Prerequisite:

A. Baccalaureate degree in physical education or related field, with competence equivalent to the following:

1. Measurement and evaluation (PE—S 360).
2. Motor learning (PE—S 361).
3. Kinesiology and biomechanics (PE—S 362).
4. Physiology of activity (PE—S 363).
5. Adaptive and corrective physical education (PE—S 460).

B. Completion of courses in the foundational sciences equivalent to the following:

1. For corrective emphasis:

- a. Anatomy and upper-division physiology (Zool. 260, 460).
- b. College physics (Phscs. 105, 106).
- c. College mathematics through trigonometry (Math. 110, 111).
- d. College chemistry (Chem. 105, 106, 107).
- e. Abnormal psychology (to Psych. 342).
- f. Food science and nutrition (FSN 435).
- g. Histology (Zool. 380) required for animal research.

2. For exercise physiology emphasis:

- a. Anatomy and upper-division physiology (Zool. 260, 460).
- b. College physics (Phscs. 105, 106).
- c. College chemistry through biochemistry (Chem. 105, 106, 107, 351, 352, 353, 481).
- d. College mathematics through calculus (Math. 110, 119)

C. PE—S 797R for candidates who have not written a thesis. These candidates must produce a publishable research manuscript before beginning work on a dissertation. (This is a prerequisite and will not count toward the 78 hours.)

III. Entry times: Fall semester and summer term only.

Requirements for Degree

- I. Credit hours (78): Minimum of 60 course work hours beyond baccalaureate degree, plus 18 dissertation hours (PE—S 799R) and the skill requirement. Required core courses:
 - A. Exercise physiology: PE—S 561, 568, 630, 659, 662, 666, 667, 669, 691, 693R, 766, 769.
 - B. Corrective : PE—S 550, 560, 561, 582, 599R, 630, 659, 662, 663, 666, 667, 669, 691.
- II. Supporting field: 20 hours required.
 - A. Exercise physiology: Chem. 584; Zool. 565, 566, 662R; 11 additional approved hours.
 - B. Corrective : 20 hours from Hlth. 561, Psych. 535, 585, FamSc. 514, Zool. 560, 584, FSN 531, 532, 631R.
- IV. Electives: Choose from graduate courses in physical education and related fields.
- V. Minor: Approved minors related to field of emphasis.
- VI. Skill requirement: Consult department.
- VII. Dissertation.
- VIII. Examinations:
 - A. Comprehensive examination.
 - B. Oral defense of dissertation.

Program and Degree Resources

1. Anatomy: Five cadavers and skeletons.
2. Biomechanics: Video replay analysis, force test table with cable tensiometers, Cybex II, digitizer and IBM computer, and high-speed cinematographic equipment.
3. Exercise biochemistry: Biochemical analysis, muscle histology, and muscle biopsy equipment and facilities.
4. Human performance: Treadmills, bicycle ergometers, hydrostatic weighing facility, breath-by-breath VO_2 analysis system, EKG units, and Cybex.
5. Small animal facility: 200 animal cages, rodent treadmill, tissue traumatizer, and separation force instrument.
6. Athletic training: Two large, well-equipped facilities plus three satellite training rooms located in the Marriott Center and football stadium.
7. Motor learning: Basic equipment used for laboratory associated with motor learning classes. Devices for measuring learning, speed of movement, and reaction time.

Physical Education—Sports Graduate Courses

550. Motor Development and Growth of Children. (2)

Existing body of knowledge regarding motor development of children and significance of physical activity in early childhood.

560. Advanced Corrective Physical Education. (2)

Prerequisite: PE—S 460.

Techniques of postural evaluation, muscle testing, therapeutic exercises, and relaxation; extent and limitations of the physical educator's responsibility for recognizing divergent conditions; referral procedures.

561. Functional Anatomy and Kinesiology. (4)

Prerequisite: PE—S 362, 363, 460, or equivalent.

Study of human anatomy with adaptation to basic kinesiological principles and procedures.

568. Problems in Conditioning. (2)

Prerequisite: PE—S 363.

Application of scientific principles to problems in conditioning.

582. Physical Education for the Mentally Retarded. (2)

Prerequisite: baccalaureate degree in physical education.

Theoretical and practical aspects of teaching the mentally retarded child and adult.

586R. Workshop in Fitness and Sport. (1-4)

Prerequisite: undergraduate major in physical education or equivalent.

599R. Practicum. (1-9)

Prerequisite: PE—S 568 or concurrent registration for conditioning coaches.

Field experience for physical education students; fifty hours of volunteer service in approved organization required per credit hour.

620. Advanced Athletic Training. (3)

Prerequisite: PE—S 320, 420.

Advanced theory and practical skills in prevention, immediate care, and treatment of injuries.

621. Physical Examination and Rehabilitation of Athletic Injuries. (2)

Prerequisite: PE—S 320, 363, 420, 460, 560, 620.

For athletic training students. Specific rehabilitation programs for specific injuries; examining the injury.

622. Therapeutic Modalities in the Treatment of Athletic Injuries. (2)

Prerequisite: PE—S 320, 363, 420, 620.

For athletic training students. Hydrotherapy, massage, traction, radiant energy, heat, cold, and electrotherapy.

624. Orthopedics in Sports Medicine. (3)

Prerequisite: PE—S 320, 420, 460, 561, 620, 629R.

For athletic training students. Orthopedics of the injured athlete.

629R. Athletic Training Practicum. (1-6)

Prerequisite: PE—S 320, 420, 620, and consent of advisor.

Academic and practical application of athletic training skills in the training room setting.

630. Research Methods in Physical Education. (3)

Prerequisite: PE—S 360 or equivalent.

Understanding, designing, and conducting research; writing for publication in physical education.

631. Research Design in Physical Education. (2)

Prerequisite: PE—S 360 or equivalent; PE-S 630.

Designing, conducting, and analyzing data for experimental and survey research studies in physical education using standard statistical procedures.

649. Curriculum Theory and Design in Physical Education. (3)

Theoretical and practical aspects of curriculum design in physical education.

650. Measurement and Evaluation in Physical Education. (2)

Instruments and procedures for psychomotor, fitness, cognitive, and affective assessment in physical education.

651. Personnel Management and Supervision in Physical Education. (3)

Theory and practice of successful personnel management and supervision in physical education.

652. Administration of Physical Education and Athletic Programs. (3)

Administration and management of physical education, athletic, and related programs and the role of public relations in these programs.

654. History of Physical Education. (3)

Review and analysis of historical facts and events in physical education and sports.

655. Philosophy: Ethics and Issues. (2)

Ethical and moral interpretations and concepts underlying the profession.

656. Psychological Implications of Sport. (2)

Prerequisite: graduate standing; Psych. 111, PE—S 450, or equivalent.

Review of the psychological phenomena inherent in sport as they relate to the teacher/coach, participant, and spectator.

657. Sport and Society. (2)

Prerequisite: PE—S 450 or equivalent.

Relationship of sport to other elements of society, emphasizing the twentieth century.

658. Learning Theory, Sport Pedagogy, and Instructional Design in Physical Education. (3)

Prerequisite: PE—S 659.

Systematic approach to designing and evaluating cognitive, psychomotor, and affective instruction in physical education.

659. Theory of Motor Learning. (2)

Prerequisite: PE—S 361.

Theories and methods of learning physical skills.

661. Fitness and Wellness in the Workplace. (3)

Management for effectively designing, marketing, implementing, and administering health promotion programs.

662. Mechanical Analysis of Activities. (2)

Prerequisite: PE—S 362.

Analysis of movement mechanics in sport, dance, and athletic activities to identify how to achieve the highest degree of skill possible in each activity.

663. Research Techniques in Biomechanics of Sport. (2)

Prerequisite: PE—S 362, 662.

Theory and practice of research techniques in biomechanics: statics, dynamics, body segment parameters, photoinstrumentation, electronic instrumentation, digital computer techniques, literature sources, and laboratory fundamentals.

666. Exercise Physiology. (3)

Prerequisite: PE—S 363.

Adjustments made by the body to accommodate physical activity.

667. Laboratory Methods and Procedures. (2)

Prerequisite: PE—S 363, 666, or concurrent registration in PE—S 666.

Basic techniques and procedures used in human performance laboratories.

669. Exercise, Testing, and Prescription in Coronary Heart Disease. (2)

Prerequisite: PE—S 666, 667.

In-depth study of coronary heart disease: risk factors, symptoms, and interventions; role of exercise in testing, prescription, and rehabilitation.

685. Physical Education in the Elementary School. (2)

For teachers, administrators, and supervisors. Curricular interrelationships and content materials directed toward obtaining educational results.

691. Seminar. (1)

Prerequisite: acceptance into graduate program.

Evaluation of students' aptitudes, leadership qualities, and ability to successfully complete a graduate program.

693R. Graduate Seminar in Readings. (1)

Prerequisite: PE—S 666 or concurrent registration for exercise physiology section.

Weekly seminar covering selected topics in physical education. Doctoral students in exercise physiology should enroll each semester.

699R. Master's Thesis. (1-9)**751R. Doctoral Seminar: Curriculum, Instruction, and Leadership. (2)**

Prerequisite: registration in Ed.D. program. Students must enroll for four consecutive semesters.

Selected topics in curriculum, instruction, and leadership for university professors and consultants. Topics rotate each semester: teaching physical education in higher education; research and publication; program coordination, advisement, and supervision in public schools and colleges; grantsmanship.

755. Research on Teaching and Teacher Evaluation in Physical Education. (2)

Prerequisite: PE—S 659.

Review of research on teaching and teacher evaluation affecting teaching and administration of physical education.

766. Advanced Exercise Physiology: Cardio-pulmonary. (2)

Prerequisite: PE—S 666, 667.

Cardiovascular and pulmonary systems and how they meet the metabolic needs of muscles during exercise.

769. Advanced Exercise Physiology: Skeletal Muscle. (3)

Prerequisite: PE—S 666, Chem. 581.

Effects of acute and chronic exercise on anatomy, physiology, and biochemistry of skeletal muscle.

797R. Individual Research and Study in Physical Education. (2–9)

Prerequisite: undergraduate major in physical education; matriculation for graduate study in the department.

799R. Doctoral Dissertation. (1–18)

Physics and Astronomy

Chair: Daniel L. Decker, 296 ESC, 378-4361

Graduate Coordinator: Dorian M. Hatch, 277 ESC, 378-2427

Faculty/Specialties

Professors

Ballif, Jae R. (1962) Ph.D., University of California, Los Angeles, 1962. Space Physics.

Barnett, J. Dean (1958) Ph.D., University of Utah, 1959. Solid-State Physics.

Decker, Daniel L. (1958) Ph.D., University of Illinois, 1958. Solid-State Physics.

Dibble, William E. (1961) Ph.D., California Institute of Technology, 1960. X Rays.

Dudley, J. Duane (1956) Ph.D., University of Utah, 1959. Acoustics.

Evenson, William E. (1970) Ph.D., Iowa State University of Science and Technology, 1965. Theoretical Solid-State Physics, Theoretical Physics.

Hansen, H. Kimball (1963) Ph.D., University of California, Berkeley, 1966. Astrophysics.

Harrison, B. Kent (1964) Ph.D., Princeton University, 1959. General Relativity.

Hatch, Dorian M. (1968) Ph.D., State University of New York, 1968. Theoretical Solid-State Physics, Group Theory.

Hill, Max W. (1958) Ph.D., University of California, Berkeley, 1959. Nuclear Physics.

Jensen, Gary Lee (1966) Ph.D., University of Michigan, 1964. Nuclear Physics.

Jones, Douglas E. (1964) Ph.D., Brigham Young University, 1964. Space Physics.

Knight, Larry V. (1973) Ph.D., Stanford University, 1965. Lasers, X Rays.

Larson, Everett Gerald (1964) Ph.D., Massachusetts Institute of Technology, 1964. Theoretical Atomic Physics.

Mason, Grant W. (1970) Ph.D., University of Utah, 1969. Plasma Physics.

McNamara, D. Harold (1955) Ph.D., University of California, Berkeley, 1950. Astrophysics.

Merrill, John J. (1971) Ph.D., California Institute of Technology, 1960. Instructional Design.

Nelson, H. Mark (1959) Ph.D., Harvard University, 1960. Solid-State Physics.

Palmer, E. Paul (1966) Ph.D., University of Utah, 1956. Acoustics, Fusion.

Rasband, S. Neil (1972) Ph.D., University of Utah, 1969. Theoretical Plasma Physics.

Strong, William J. (1967) Ph.D., Massachusetts Institute of Technology, 1964. Acoustics.

Vanfleet, Howard B. (1960) Ph.D., University of Utah, 1961. Solid-State Physics.

Associate Professors

Allred, David D. (1987) Ph.D., Princeton University, 1977. Lasers, X Rays, Surface Physics.

Christensen, Clark G. (1972) Ph.D., California Institute of Technology, 1972. Astrophysics.

Jones, Steven E. (1985) Ph.D., Vanderbilt University, 1978. Muon Catalyzed Fusion

Spencer, Ross L. (1984) Ph.D., University of Wisconsin, 1979. Theoretical Plasma Physics.

Stokes, Harold T. (1981) Ph.D., University of Utah, 1977. Theoretical Solid-State Physics.

Taylor, Benjamin J. (1980) Ph.D., University of California, Berkeley, 1969. Astrophysics.

Assistant Professors

Hart, Grant W. (1985) Ph.D., University of Maryland, 1983. Plasma Physics.

Moody, Joseph Ward (1990) Ph.D., University of Michigan, 1986. Astrophysics.

Rees, Lawrence B. (1986) Ph.D., University of Maryland, 1983. Nuclear Physics.

Van Huele, Jean-Francois (1988) Ph.D., Brussels Free University, 1987. Theoretical Physics.

Graduate Programs and Degrees

Physics (M.S.)

Physics (Ph.D.)

Physics and Astronomy (Ph.D.)

Areas of Emphasis

Acoustics, astrophysics, atomic physics, nuclear physics, physics education, planetary and space physics, plasma physics, solid-state physics, theoretical physics.

The Department of Physics and Astronomy provides an opportunity for inquiring into the nature of the physical world and the laws that govern our universe. Training and perspective for students with a wide range of career objectives are provided, including scientific research, teaching, engineering, business, law, health, and other fields outside science.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Financial Aid

Qualified graduate students receive financial aid that may take the form of one or more of the following: teaching assistantships, research assistantships, scholarships (including the John Einar Anderson scholarship), internships (university-sponsored fellowships), or tuition awards. The amount of financial aid given depends on individual merit.

Program and Degree Requirements

Physics (M.S.)

The master of science degree is sometimes sought by those who intend to continue on for the Ph.D., but more often it serves as a terminal degree for those who intend to work in industrial or governmental research or teaching.

Admission and Entry

1. Application requirements:

- A. Deadline: February 15 for fall semester admission. This is earlier than the general university deadline.
- B. Entrance examinations: GRE advanced physics subject test.
- II. Prerequisite: Baccalaureate degree in physics or equivalent. Appropriate course work will be suggested by graduate advisor for removing deficiencies in undergraduate study.
- III. Entry time: Fall semester recommended.

Requirements for Degree

- I. Credit hours (30): Minimum 24 approved course work hours including 18 hours of nonrepeatable graduate courses (a repeatable course is one whose number ends in R), plus 6 thesis hours (Phscs. 699R).
- II. Before admission to candidacy, a student must pass the GRE advanced physics subject test with a minimum of 40 percent, be accepted as a research student by a member of the faculty of the Department of Physics and Astronomy and must submit a proposed study list. This is normally completed at the beginning of the second semester of the first year of graduate study.
- III. Required course: Phscs. 591R (graduate seminar) each semester of residence.
- IV. Thesis.
- V. Examinations: Final oral examination and defense of thesis.

Physics (Ph.D.)

Physics and Astronomy (Ph.D.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 15 for fall semester admission.
 - B. Entrance examinations: GRE advanced physics subject test.
- II. Entry times: Fall semester recommended.

Requirements for Degree

- I. Credit hours (66): Minimum of 48 (B- grade or better in each class) hours in approved course work exclusive of graduate seminars (see Phscs. 591R); plus dissertation (18 hours minimum, Phscs. 799R).
- II. Before admission to candidacy, a student must pass the GRE advanced physics subject test with a minimum score of 80 percent, be accepted as a research student by a member of the faculty of the Department of Physics and Astronomy, and submit a proposed study list. The study list is normally completed at the beginning of the second semester of graduate studies.
- III. Required core courses:
 - A. Phscs. 591R each semester of residence.
 - B. For physics degree: Phscs. 517, 518, 621, 641, 642, 651, 652.
 - C. For physics and astronomy degree: Phscs. 517, 518, 527, 528, 621, 651, 652.

- IV. Required courses in emphasis: At least 12 hours in the specialty listed below that is most closely related to the field of research to constitute a major and 12 hours in a second specialty to constitute a minor. No duplication between the courses listed below and those listed above is permitted. Students whose research is in acoustics may, with the approval of their committee, construct a 12-hour minor that includes courses outside the department.

- A. Acoustics: Phscs. 561, 562, 565, 566, 581, 623, 631, 681.
- B. Astrophysics: Phscs. 527, 528, 529, 611, 612, 627, 628, 711R.
- C. Atomic physics: Phscs. 527, 528, 571, 631, 632, 671, 711R.
- D. Nuclear physics: Phscs. 631, 655, 656, 711R, 751, 752.
- E. Plasma physics: Phscs. 536, 537, 545, 546, 623, 631, 632, 645, 646, 711R.
- F. Solid-state physics: Phscs. 623, 631, 632, 681, 682, 711R.
- G. Theoretical physics: Phscs. 617, 618, 619, 625, 626, 632, 711R, 751, 752.
- H. Planetary and space physics: Phscs. 536, 537, 545, 546, 711R.
- I. Physics group for physics and astronomy degree only: Phscs. 536, 537, 625, 626, 645, 646, 655, 656, 711R (6 hours); 631, 632, 641, 642 (6 hours).

- V. Foreign language/Skill requirement: Select any one of the following four options:

- A. Option 1: Single language. Demonstrate a thorough familiarity with French, German, or Russian. An examination will test ability to (1) translate literature in the student's field and (2) communicate orally in the language. In lieu of a special examination, the student can meet this requirement by completing a minimum 22 semester hours in the language chosen with a GPA of B (3.0) or higher. In either case, the language department involved must certify competency.
- B. Option 2: Two languages. Complete one of the following requirements for each language. Acceptable languages are French, German, and Russian.
 - 1. Take and pass approved intensive reading courses in the language.
 - 2. Complete 16 semester hours of credit with an average grade of B (3.0) in the language.
- C. Option 3:
 - 1. Demonstrate competency in reading Russian, French, or German.
 - 2. Demonstrate competency in the use of computers as they relate to scientific computations comparable to the completion of a 3-hour computer science course.
 - 3. Complete satisfactorily 6 hours of course work, approved by the advisory committee and selected from:
 - a. Upper-division or graduate mathematics courses (except Math. 343, 344, 434).

- b. Upper-division or graduate statistics or computer science courses emphasizing the use of statistics and computers in the physical sciences.
 - c. Phcs. 617, 618.
- D. Option 4:
 - 1. Complete requirements 2 and 3 of Option 3.
 - 2. Complete satisfactorily 9 more hours of course work, approved by the advisory committee and selected from the list in requirement 3 of Option 3.
- VI. Dissertation.
- VII. Examinations:
 - A. Comprehensive written examination when next given after completion of required courses. These are regularly scheduled early in September.
 - B. Comprehensive oral examination and defense of dissertation.

Physics and Astronomy Graduate Courses

513R. Special Topics in Contemporary Physics. (1–3) W on dem.

Prerequisite: consent of instructor.

Topics generally related to recent developments in physics.

517, 518. Mathematical Physics. (3 ea.) F, W

Prerequisite: Phcs. 318, Math. 434.

Topics in modern theoretical physics, including applications of matrix and tensor analysis and linear differential and integral operators.

527, 528. Introduction to Astrophysics. (3 ea.) F, W

Prerequisite: consent of instructor.

Principles and observational techniques of astrophysics.

529. Observational Astrophysics. (3) On dem.

Prerequisite: Phcs. 527, 528.

Survey of important areas of current research.

536, 537. Space and Planetary Physics. (3 ea.) F, W even yr.

Prerequisite: Phcs. 321, 431, 442.

Solar plasmas, planetary atmospheres and interiors, comets, cosmic rays, and space measurement techniques.

545. Introduction to Plasma Physics. (3) F odd yr.

Prerequisite: Phcs. 321, 431, 441.

Introduction to plasma physics, including single-particle motion and both fluid and kinetic models of plasma behavior.

546. Plasma Transport. (3) W odd yr.

Prerequisite: Phcs. 545.

Transport processes in plasmas applied to space physics, fusion, and laser plasmas.

551, 552. Modern Physics. (3 ea.) F, W

Prerequisite: Phcs. 222, 318.

Special relativity; analytical foundations of quantum mechanics; applications to atomic, molecular, statistical, solid-state, and nuclear physics; elementary particles.

561. Fundamentals of Acoustics. (3) W

Generation, transmission, and reception of sound.

Vibrating systems, properties of elastic media, mechanical and electrical energy, and radiation.

562. Acoustical Measurements. (1–3) On dem.

Prerequisite: completion of or concurrent registration in Phcs. 561.

Selected experiments in acoustics.

565. Acoustics of Music and Speech. (3) F odd yr.

Prerequisite: Phcs. 561 or consent of instructor.

Sound production and perception, techniques for analysis and synthesis, computer modeling, machine recognition, and ensemble effects.

566. Architectural Acoustics and Noise. (3) F even yr.

Prerequisite: Phcs. 561 or consent of instructor.

Computer modeling of enclosures, techniques for measuring noise spectra, room design, noise control.

571. Laser Physics. (3) On dem.

Prerequisite: Phcs. 222, Math. 344; basic understanding of atomic physics and optics.

Physics of coherent radiation throughout the electromagnetic spectrum, including amplification and laser cavities. Discussion based on quantum mechanical principles, but mathematical treatment classical.

581. Solid State Physics. (3) W

Prerequisite: Phcs. 222.

Introduction for students in physics, chemistry, geology, and engineering. Phenomena occurring in solids, and their related physical concepts.

591R. Colloquium. (0.5) F, W

Required of all graduate students every semester in residence.

597. Physical Measurements. (1–3) On dem.

Individual experiments in a number of physics areas selected from students' major or minor.

611, 612. Astrophysics. (3 ea.) On dem.

Prerequisite: consent of instructor.

Theory of stellar atmospheres and interstellar matter.

617. Advanced Topics in Theoretical Physics. (3) F even yr.

Applications of tensor analysis, differential geometry, and differential forms to such topics as mechanics, optics, relativity, and fluid dynamics.

618. Advanced Topics in Theoretical Physics. (3) F odd yr.

Introductory group theory. Basic representation theory and developments, with applications to quantum mechanics and molecular and solid state physics.

619. Advanced Topics in Theoretical Physics. (3) W odd yr.

Prerequisite: Phcs. 618.

Advanced group theory. Space groups and lie groups with applications in solid state physics (energy band representations, phase transitions, etc.), nuclear physics, and quantum field theory (particle classification schemes, etc.).

621. Dynamics. (3) F

Prerequisite: Phscs. 321.

Advanced treatment of classical mechanics, including Lagrange's and Hamilton's equations, rigid body motion, and canonical transformations.

623. Dynamics of Continuous Media. (3) W odd yr.

Prerequisite: Phscs. 621.

Mechanics of systems with an infinite number of degrees of freedom. Topics include elasticity and hydrodynamics.

625. Theory of Relativity. (3) On dem.

Prerequisite: Phscs. 551, 621.

Review of special relativity and general relativity, with applications to modern astrophysics.

626. Relativistic Astrophysics. (3) On dem.

Prerequisite: Phscs. 625.

Applications of general relativity to modern astrophysics, including gravitational collapse, black holes, cosmological models, gravitational waves, etc.

627, 628. Advanced Topics in Astrophysics. (3 ea.) On dem.

Prerequisite: consent of instructor.

Internal structure of stars; galactic structure.

631, 632. Statistical Mechanics. (3 ea.) F, W even yr.

Prerequisite: Phscs. 431, 551.

Advanced thermodynamics, classical statistical mechanics, quantum statistics, and transport theory.

636. Solar System Magneto-Plasma Interactions. (3) F odd yrs.

Prerequisite: Phscs. 536, 537.

Interactions of plasmas with atmospheres and surfaces of solar system objects such as planets, comets, and moons.

641, 642. Mathematical Theory of Electricity and Magnetism. (3 ea.) F, W

Prerequisite: Phscs. 442.

Advanced electrostatics and magnetostatics, Maxwell's equations and electromagnetic waves, relativistic electrodynamics, radiation theory, and interaction of matter with electromagnetic fields.

645, 646. Plasma Physics. (3 ea.) F, W even yrs.

Prerequisite: Phscs. 431, 621, 642 for 645; Phscs. 645 for 646.

Plasma state of matter, including a description in terms of both individual particles and fluids, with applications.

651, 652. Quantum Mechanics. (3 ea.) F, W

Prerequisite: Phscs. 518, 551.

Nonrelativistic quantum mechanics, with applications.

655, 656. Nuclear Physics. (3 ea.) F, W odd yrs.

Prerequisite: Phscs. 552.

Fundamental properties of nuclei, nuclear forces, nuclear models, electromagnetic properties of nuclei, particle radioactivity, nuclear reactions, and interaction of radiation with matter.

671. X-Ray Physics. (3) W odd yrs.

Prerequisite: Phscs. 518, 552, and 581.

Physical characteristics of x-ray generation, optics, and experimental applications. Methods of x-ray imaging emphasized.

681, 682. Modern Theory of Solids. (3 ea.) F, W odd yrs.

Prerequisite: Phscs. 481, 651.

Quantum theory of solids, emphasizing the unifying principles of symmetry, energy-band theory, dynamics of electrons and of periodic lattices, and cooperative phenomena.

697R. Research. (1-6) F, W, Sp, Su

699R. Master's Thesis. (1-9) F, W, Sp, Su

711R. Advanced Topics in Physics. (1-3) On dem.

Prerequisite: consent of instructor.

Recent and upcoming topics include chaos, thin films, phase transformations, amorphous solids, astrophysics using nontraditional frequencies, and particle physics.

751, 752. Advanced Quantum Theory. (3 ea.) F, W even yrs.

Prerequisite: Phscs. 652.

Topics in relativistic quantum mechanics, including quantum field theory.

797R. Research. (1-9) F, W, Sp, Su

799R. Doctoral Dissertation. (1-9) F, W, Sp, Su

Political Science

Chair: Stanley A. Taylor, 745 SWKT, 378-3423

Graduate Program and Degree Political Science (M.A.)

The Department of Political Science currently offers only a joint B.A./M.A. degree in public policy analysis. Undergraduate students interested in this program should consult with the department or refer to the BYU General Catalogue.

Psychology

Chair: David V. Stimpson, 1001 SWKT, 378-4287

Graduate Coordinator: Kenneth L. Higbee, 1092 SWKT, 378-6363

Faculty/Specialties

Professors

Bednar, Richard L. (1982) Ph.D., University of Minnesota, 1968. Theories of Group Work: Psychotherapy, Psychopathology, Personality, Self-Esteem.

Bennion, Robert C. (1961) Ph.D., Ohio State University, 1961. Social Learning and Personal Construct Theories. Bergin, Allen E. (1972) Ph.D., Stanford University, 1960. Psychology and Religion, Personality Theory.

Bigler, Erin D. (1990) Ph.D., Brigham Young University, 1974. Neuropsychology-Neurophysiology, Neuropsychological Diagnostics and Consultation, Sensory-evoked Potentials.

Brown, Bruce L. (1968) Ph.D., McGill University, Montreal, 1969. Psycholinguistics, Statistics and Research Methods.

Bunker, Gary L. (1970) Ph.D., University of California, Berkeley, 1966. Prejudice and Intergroup Relations.

Cundick, Bert P. (1962) Ph.D., Ohio State University, Columbus, 1962. Child Development and Assessment.

- Daniels, Philip B. (1961) Ph.D., Harvard University, 1962. Interpersonal Relationships Within Groups, Leadership Training.
- Fleming, Donovan E. (1971) Ph.D., Washington State University, 1962. Hormones, Brain Function, and Behavior.
- Higbee, Kenneth L. (1970) Ph.D., Purdue University, 1970. Cognitive Psychology with a Focus on Learning and Memory, Research Methodology.
- Howell, Robert J. (1952) Ph.D., University of Utah, 1951. Psychopathology, Forensic Psychology.
- Jensen, Larry C. (1965) Ph.D., Michigan State University, 1966. Human Development with a Focus on Moral Reasoning and Behavior.
- Lambert, Michael J. (1971) Ph.D., University of Utah, 1971. Research in Psychotherapy Process and Outcome, Sport Psychology.
- Miller, Harold L., Jr. (1975) Ph.D., Harvard University, 1975. Experimental Analysis of Learning and Motivation.
- Payne, I. Reed (1964) Ph.D., Pennsylvania State University, 1963. Criminal Behavior, Therapeutic Techniques.
- Pedersen, Darhl M. (1962) Ph.D., University of Illinois, 1962. Quantitative Methods, Personality, Environmental Psychology.
- Robinson, Paul W. (1969) Ph.D., Utah State University, 1973. Behavior Modification, Analytical Methodology.
- Smith, Kay H. (1961) Ph.D., Wayne State University, 1962. Group Dynamics and Assessment of Interpersonal Skills.
- Sorenson, David M. (1969) Ed.D., Harvard University, 1970. Psychodiagnostics, Human Development.
- Stimpson, David V. (1964) Ph.D., University of California, Berkeley, 1964. Behavioral and Personality Correlates of Persuasibility, Organizational Psychology.
- Weight, David G. (1969) Ph.D., University of Washington, 1969. Psychopathology, Assessment, Neuropsychology.

Associate Professors

- Barlow, Sally H. (1978) Ph.D., University of Utah, 1978. Theory and Training in Individual and Group Therapy, Race and Gender Diversity, Advanced Objective Assessment.
- Burlingame, Gary M. (1983) Ph.D., University of Utah, 1983. Short-Term Individual and Group Therapy, Research Design, Psychometrics.
- Wells, Marion Gawain (1972) Ph.D., Purdue University, 1972. Psychotherapy, Clinical Child Psychology, Child and Adolescent Assessment.
- Williams, Richard N. (1981) Ph.D., Purdue University, 1981. Theoretical and Philosophical Foundations of Social Psychology.
- Wood, Larry Eugene (1977) Ph.D., University of Iowa, 1971. Artificial Intelligence, Cognitive Psychology.

Assistant Professors

- Bloch, George J. (1989) Ph.D., Stanford University, 1968. Physiological Psychology, Neuroendocrinology.
- Maughan, Michael L. (1972) Ed.D., Utah State University, 1970. Psychotherapy, Adult Development, Biofeedback / Stress Management.
- Orme, G. Craig (1983) Ph.D., Utah State University, 1980. Clinical Application, Behavioral Medicine/Health Psychology, Crisis Intervention.

- Roberts, Tomi-Ann. (1990) Ph.D., Stanford University, 1990. Psychological Gender Differences and Similarities, Emotion and Motivation.

Assistant Clinical Professor

- Nielsen, Stevan Lars (1988) Ph.D., University of Washington, 1984. Psychotherapy, Psychological and Neuropsychological Assessment, Personality Theory, Cognitive and Developmental Psychology.

Graduate Programs and Degrees

- Psychology (M.S.)
School Psychology (Specialist Certificate)
Psychology (Ph.D.)
Clinical Psychology (Ph.D.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Psychology (M.S.)

The master's degree in psychology provides advanced education in preparation for application to doctoral programs; community college, junior college, or high school teaching; and general strengthening of expertise in psychology. It is not intended as a terminal professional degree.

Admission and Entry

- I. Application requirements:
 - A. Deadline: January 31.
 - B. Entrance examination: General GRE; score subject to review.
 - C. GPA: Minimum 3.0 for the last 60 hours.
- II. Prerequisite:
 - A. Baccalaureate degree in psychology (other fields will be considered).
 - B. Undergraduate major in psychology desirable. Previous course work should include general psychology, elementary psychological statistics, experimental psychology, and three additional psychology courses.
- III. Entry time: Fall semester.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (699R).
- II. Required courses: B grade or better in Psych. 501 and 502 (first two semesters in residence); and in three of the following: Psych. 510, 520, 540, 550, 560, 565, 575, 583.
- III. By the end of the first semester students must select their advisory committee, submit their study list, and schedule their thesis prospectus review.
- IV. Electives: Determined in consultation with advisory committee.
- V. Thesis.
- VI. Examination: Final oral examination on course work and defense of thesis.

School Psychology (Specialist Certificate)

The school psychology program is an interdepartmental program that is administered by the Departments of Psychology and Educational Psychology. After completing a 36-semester-hour master of education degree, students apply to the Department of Psychology for the 68-hour psychological specialist certificate (30 hours beyond the M.Ed.). Students complete the research portion of the training program in the Department of Psychology in conjunction with the specialist certificate and conduct their research project under the direction of a two-member committee they have selected.

Admission and Entry

- I. Application requirements:
 - A. Deadline: March 31.
 - B. Entrance examination: General GRE; score subject to review.
- II. Prerequisite:
 - A. M.Ed. degree.
 - B. Adequate background in both psychology and education; undergraduate major in one or the other preferred.
 - C. Required course work: Courses in learning, personality, child psychology, exceptional children, statistics, school organization and administration.
- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (30): Minimum 30 course work hours beyond the M.Ed.
- II. Required courses in sequence:
 - Fall Semester
 - Psych. 500R, 696R; EPsy. 505, 680R, 690R.
 - Winter Semester
 - Psych. 696R; EPsy. 680R, 690R; electives (3 hours).
 - Spring Term
 - EPsy. 680R; electives (3 hours).
- III. Practical experience: Initial practical experiences offered in conjunction with applied classes in program (4–8 hours per week in school setting).
- IV. Field project.
- V. Examination: Oral defense of field project.
- VI. Internship: Full school year internship in an approved setting is a culminating experience.
- VII. Certification requirements.

Note: Most states require the certification of practicing school psychologists. Early in the program students should examine the certification requirements of the state or states in which they may wish to work. Requirements for a specific state may be obtained by writing to that state's department of education.

Direct inquiries about this program or the M.Ed. prerequisite to the coordinator of school psychology, 284 TLRB, Brigham Young University, Provo, UT 84602; telephone (801) 378-4050.

Psychology (Ph.D.)

The doctoral program in psychology offers rigorous educational experience leading to the Ph.D. degree. The first three semesters of the program are designed to provide broad coverage of the substantive areas of the field,

training in research skills, and introduction to the particular areas of specialization offered in the program. During the last two years of the program students will pursue specialized course work and training in one of five emphasis areas: (1) applied social psychology, (2) biobehavioral psychology, (3) instructional psychology, (4) learning and cognition, and (5) theoretical/philosophical psychology.

The course work for these emphasis areas will be outlined under the supervision of the student's advisory committee. The instructional psychology emphasis area will, additionally, have the following requirements: (1) one member of the advisory committee must be from the Instructional Science department; (2) students must complete IS 515R, 564, 652, 661, 657R or 667R, and 687R; and (3) students must complete a minimum of 12 hours of IS 680R by participating in either an internship or assistantship.

During the first year students should select a faculty advisor and an advisory committee. All students will complete a common core of course work during the first three semesters. Following the completion of these requirements, students will concentrate on course work and research in the emphasis area they wish to pursue under the direction of the advisory committee.

Admission and Entry

- I. Application Requirements:
 - A. Deadline: January 31.
 - B. Entrance examination: General GRE (verbal, quantitative, and analytical)
- II. Entry time: Fall semester only.

Requirements for the Degree

- I. Credit hours (63 plus skill): Minimum 45 course work hours plus 18 dissertation hours (799R) and skill requirement hours.
- II. Required core courses: Psych. 501, 502, 510, 540, 550, 560, 575, 583, 600R, 605, 606, 607.
- III. Other program requirements:
 - A. All students will be required to complete a research thesis by the end of their second year in the program.
 - B. Examinations: By the end of their third year in the program (August), all students will complete and defend before a faculty examining committee a major literature review in the emphasis area of their choice. This project should constitute a contribution to the field and demonstrate mastery of a body of research literature.
 - C. Dissertation: By the end of their fourth year in the program students should complete and defend a dissertation in their chosen emphasis area (including a journal article in a form acceptable for submission, appended to the dissertation).
- IV. Sequence of program requirements:
 - A. **First year:** *Fall*, Psych. 501, 550, 560, 605. *Winter*, Psych. 502, 540, 583, 606.
 - B. **Second year:** *Fall*, Psych. 575, 600R, 607. By the end of the second year students should have completed and defended a research thesis.

- C. **Third year:** Students specialize in an emphasis area (or emphasis areas), take course work selected in consultation with their advisory committee, complete skill requirements, and complete the specialty literature review project.
- D. **Fourth year:** This year is devoted to finishing course work and training in an emphasis area, and to completing the dissertation. Students must complete 18 hours of dissertation credit (Psych. 799R) as part of the dissertation requirement.
- V. **Skill requirement:** This requirement will be met by Psych. 301 or equivalent, Psych. 501, Psych. 502, and additional course work as approved by advisory committee to total 18 hours minimum.

Clinical Psychology (Ph.D.)

The clinical psychology training program at Brigham Young University is accredited by the American Psychological Association and leads to the Ph.D. degree. This program is ordinarily completed in five years, including a one-year, full-time internship completed in an accredited agency away from the university. Candidates with varied backgrounds who have strong academic and clinical promise are recruited.

The philosophy of the clinical training program adheres to the scientist-professional model. Training focuses on academic and research competence as well as concentrating on the theory and practicum experiences necessary to develop strong clinical skills.

The program at Brigham Young University is eclectic in its theoretical approach, drawing from a wide range of theories and orientations in an attempt to give broad exposure to a diversity of traditional and innovative approaches. All students receive a basic core of training in adult clinical psychology. They may also elect to take a special emphasis in: (1) child, adolescent, and family, (2) clinical neuropsychology, (3) clinical research, or (4) values, religion, and mental health.

Admission and Entry

- I. Application requirements:
 - A. Deadline: January 31.
 - B. Entrance examination: General GRE (verbal, quantitative, analytical).
- II. Prerequisite: Course work in introductory psychology, statistics, experimental, personality, abnormal, learning or cognition, and tests and measurements.
- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (128 minimum).
- II. Skill requirements:
 - A. Undergraduate statistics (3 hours).
 - B. Undergraduate research design and analysis (3 hours).
 - C. Research methodology: Psych. 500R—Measurement, Psych. 500R—Design, Psych. 500R—Clinical Research (9 hours).
 - D. Graduate statistics: Psych. 501, 502 (10 hours).
- III. General core courses:
 - A. Biological bases of behavior: Psych. 583, 687R (6 hours).

- B. Social bases of behavior: Psych. 637 (3 hours).
- C. Cognitive-affective bases of behavior: Psych. 560 or 575 (3 hours).
- D. Individual differences: Psych. 520, 645 (6 hours).
- E. History and systems: Psych. 510 (3 hours).
- F. Ethics and standards: Psych. 609 (3 hours).

IV. Clinical courses:

- A. Assessment: Psych. 622, 623, 624 (9 hours).
- B. Psychotherapy: Psych. 651, 652, 653, 654 (12 hours).
- C. Personality and psychopathology: Psych. 611, 612, 675, 744R (9 hours).
- D. Practicums, clerkships, and case conferences: Psych. 740R, 741R, 743R (29 hours minimum).
- E. Internship: Psych. 745, 746, 747, 748 (8 hours).
- F. Dissertation: Psych. 799R (18 hours).
- V. **Emphasis sequences:** A sequence of elective courses may be taken in the following emphasis areas:
 - A. Child, adolescent, and family.
 - B. Clinical neuropsychology.
 - C. Clinical research.
 - D. Values, religion, and mental health.
- VI. **Dissertation** (including a journal article in a form acceptable for submission, appended to the dissertation) to be completed before internship.
- VII. **Internship:** One-year internship in a setting approved by the clinical director. Before going on internship, students complete all other requirements.
- VIII. **Examinations:**
 - A. Written and oral comprehensive examinations are taken in the first, second, and third years.
 - B. Oral defense of dissertation.

For additional information about the program, write to the director of clinical training, 284 TLRB, Brigham Young University, Provo, UT 84602; telephone (801) 378-4050.

Psychology Graduate Courses

500R. Research Methods. (3)

Intermediate course for first-year graduate psychology students, focusing on methodological tactics rather than statistical skills.

501. Data Analysis in Psychological Research 1. (5)

Prerequisite: Psych. 301 or Stat. 221.

Using and interpreting major quantitative methods in psychology; some commonly used computer methods.

502. Data Analysis in Psychological Research 2. (5)

Prerequisite: Psych. 501 or consent of instructor.

Analysis of variance and covariance, multiple regression, and experimental design; introduction to multivariate methods.

510. History and Systems of Psychology. (3)

Survey of origins and development of modern psychology, including consideration of schools and theoretical systems.

520. Advanced Developmental Psychology. (3)

Major research in developmental psychology, emphasizing theory, content, and methodology.

531. Organizational Psychology. (3)

Personal and interpersonal aspects of organizational life: goal setting, decision making, problem solving, communication, control, leadership, motivation, and change.

535. Behavior Modification Techniques. (3)

Practical application of behavior modification to academic discipline; emotional target behaviors of individuals and groups.

540. Personality Theory. (3)

Prerequisite: Psych. 341 and 5 additional hours in psychology.

Contemporary theories of personality developed within framework of major psychological systems.

550. Theory and Research in Social Psychology. (3)

Prerequisite: Psych.-Soc. 350 or consent of instructor.

Current theories and research on interaction with others.

555. (Psych.-Soc.) Group Dynamics. (3)

Prerequisite: Psych.-Soc. 350.

Theories and research on small-group processes and mass behavior.

560. Learning Theory. (3)

Prerequisite: Psych. 361 and 5 additional hours in psychology.

Critical review of current theories and persistent problems.

565. Motivational Psychology. (3)

Prerequisite: Psych. 365 or equivalent; graduate standing or consent of instructor.

Theoretical, historical, and empirical overview; recent trends and issues; role of animal studies; methodological problems.

575. Cognitive Processes. (3)

Prerequisite: Psych. 370 and 375 or equivalent; graduate standing or consent of instructor.

Major theoretical and empirical developments. Interaction of sensory, perceptual, learning, and thinking processes.

577. Human/Computer Interaction. (3)

Design of computer systems that are easy for people to use, including relevant principles and research in cognitive processes and artificial intelligence.

583. Biological and Health Psychology. (3)

Prerequisite: Psych. 381 and 382 or equivalent.

In-depth examination of biological bases of behavior from perspective of health and disease.

584. (Psych.-Zool.) Neurophysiology. (3)

Prerequisite: Zool. 460 or equivalent.

Physiology of nerve cells and neuronal interactions.

585. Human Neuropsychology. (3)

Prerequisite: Psych. 381 and 382 or consent of instructor.

Critical study of brain-behavior relationships.

586. Hormones and Behavior. (3)

Prerequisite: Psych. 381, 382.

Neural and endocrine mechanisms underlying behavior.

587. Sensory and Perceptual Processes. (3)

Recommended: Psych. 370, 381, 382.

Critical examination of sensory mechanisms and perceptual organization.

600R. Seminar in Research Methods. (3)

Prerequisite: Psych. 501.

Research strategies, methods, and design including measurement, scaling, questionnaire construction, reliability, validity, and experimental and statistical designs.

605. Professional Seminar in Psychology. (1)

Prerequisite: acceptance into Ph.D. program.

Introduction to major research areas in psychology.

606. Professional and Ethical Issues in Psychology. (1)

Prerequisite: acceptance into Ph.D. program.

Ethical issues in professional and scientific psychology.

607. Research Prospectus Development. (1)

Prerequisite: acceptance into Ph.D. program.

Supervised writing and research leading to completion and defense of prospectus for the research thesis.

609. Professional Issues and Ethics in Clinical Psychology. (3)

Prerequisite: acceptance into clinical psychology program.

Ethical issues from a historical and contemporary framework.

611. Psychopathology 1: Adult. (3)

Prerequisite: acceptance into clinical or school psychology program.

Etiology and symptoms of dysfunctional behavior and their effects on the individual, family, and community.

612. Psychopathology 2: Developmental. (3)

Prerequisite: acceptance into clinical or school psychology program.

Diagnosis and incidence of maladjustment, learning disabilities, abnormalities and subnormalities, and cultural deficits.

622. Assessment 1: Intelligence. (3)

Prerequisite: acceptance into clinical or school psychology program.

Methods used in the assessment of intellectual status in children and adults.

623. Assessment 2: Objective (3)

Prerequisite: acceptance into clinical or school psychology program.

Objective methods used in assessing the personality and behavioral characteristics of children and adults.

624. Assessment 3: Projective. (3)

Prerequisite: acceptance into clinical or school psychology program.

Projective methods used in assessing the personality and behavioral characteristics of children and adults.

625. Advanced Objective Assessment. (3)

Prerequisite: acceptance into clinical or school psychology program.

In-depth look at MMPI.

631. Professional Issues in Organizational Psychology. (3)

Prerequisite: Psych. 531.

Consultant involvement in executive and management decision making, focusing on social responsibility and ethics.

637. Social Psychology of Groups. (3)

Prerequisite: acceptance into clinical psychology program.

Theories and research on small-group processes for clinical students.

640R. Seminar in Personality. (3)

Prerequisite: Psych. 540.

Intensive analysis of selected current topics in personality research and theory.

641. Values and Mental Health. (3)

Values and religious issues in personality, psychotherapy, prevention, and mental health education.

644. Rorschach Techniques. (3)

Prerequisite: acceptance into clinical psychology program.

Theory and skill training in administering, scoring, and interpreting Rorschach tests.

645. Cultural Diversity and Gender Issues. (2)

Clinical issues in the context of cultural diversity and contemporary social trends.

648R. Seminar in Theoretical/Philosophical Psychology. (3)

Prerequisite: Consent of instructor, or acceptance into Ph.D. program.

Analysis of theoretical and philosophical issues in the discipline of psychology.

650R. Seminar in Social Psychology. (3)

Prerequisite: Psych. 551 and consent of instructor.

Variable topics including attitude change, social cognition, prosocial and antisocial behavior, group dynamics, and organizational psychology.

651. Psychotherapy 1: Interviewing Skills. (3)

Prerequisite: acceptance into clinical psychology.

Theory and techniques of the psychological interview.

652. Psychotherapy 2: Adult. (3)

Prerequisite: acceptance into clinical psychology.

Theory and techniques of adult therapy.

653. Psychotherapy 3: Child and Family. (3)

Prerequisite: acceptance into clinical psychology. Theory and techniques of child and family therapy.

654. Psychotherapy 4: Adult Group. (3)

Prerequisite: acceptance into clinical psychology. Theory and techniques of small-group processes.

655. (Psych.-Soc. 630) Attitude Measurement and Change. (3)

Prerequisite: consent of instructor.

Attitude development, change, and assessment, focusing on both individual and mass persuasion.

658. (Psych.-OrgB.) Practicum: Designing Training Programs. (3)

Theory and methods of experience-based workshops and seminars, emphasizing management, leadership, and human relations training.

660R. Seminar in Learning. (3) On dem.

Prerequisite: consent of instructor.

Critical review of contemporary literature in field of learning psychology.

667R. Seminar in the Experimental Analysis of Behavior. (3) On dem.

Prerequisite: consent of instructor.

Intensive overview of current trends and attendant philosophy. Principal attention given to research and philosophical journals.

675. Personality Dynamics. (3)

Prerequisite: acceptance into clinical psychology program.

Theories and applications to clinical situations.

676R. Seminar in Psychology and Language. (3)

Variable topics including psycholinguistics, sociolinguistics, language and dialect, and cultures in contact.

677R. Seminar in Cognitive Processes. (3)

Prerequisite: Psych. 575.

Advanced topics in cognitive science and applied artificial intelligence.

678R. Seminar in Mathematical Psychology. (3)

Variable topics including multivariate statistical methods, graphical data analytic techniques, and various mathematical models.

680. Clinical Neuropsychology. (3)

Prerequisite: acceptance into clinical psychology program and Psych. 585.

Comprehensive study of the human dysfunctional brain.

684. Advanced Psychobiology. (3)

Prerequisite: Psych. 381, 382.

Intense examination of contemporary developments in psychobiology and behavioral neurosciences.

685R. Seminar in Advanced Psychobiology. (3)

Critical examination of topics of current interest taken from contemporary literature.

687R. Seminar in Psychopharmacology. (3)

Prerequisite: Psych. 585 or equivalent.

Major classes of psychoactive drugs, emphasizing drug-behavioral interactions.

691R. Intervention Techniques in the Schools. (3)

Rationale and procedures for working with children with educational and behavioral problems in school settings.

692R. Special Topics in School Psychology. (2)

Prerequisite: acceptance into school psychology program. Computer use in school psychology.

695R. Independent Readings. (1-3)

Faculty-supervised readings as arranged by student.

696R. Field Project. (2-6)

Concluding research for school specialist program, culminating in final oral examination.

699R. Master's Thesis. (1-9)

Concluding research for master's program, culminating in final oral examination.

710R. Readings in Clinical Psychology. (1-3)

Prerequisite: acceptance into clinical psychology program.
Guided individual study in various topics.

711R. Topics in Clinical Psychology. (3)

Prerequisite: acceptance into clinical psychology program.
Theory and practice in specific topics.

712R. Topics in Neuropsychology. (3)

Prerequisite: Psych. 680 and acceptance into clinical psychology program.

Current topics, including adult and child assessment.
Other topics as determined by student interest.

740R. Case Conference. (1)

Prerequisite: acceptance into clinical psychology Ph.D. program.

Case presentations; professional, ethical, and research issues pertinent to assessment and intervention.

741R. Integrative Practicum. (1-3)

Prerequisite: acceptance into clinical psychology program.
Supervised assessment and intervention, integrating psychopathology diagnosis and treatment.

742R. Projects in Clinical Psychology. (3)

Prerequisite: acceptance into clinical psychology program.
Advanced study or skill training in various areas.

743R. Clerkship. (1-3)

Prerequisite: acceptance into clinical psychology program.
Supervised experience in community agencies.

744R. Interpersonal Skills in Clinical Psychology. (0)

Prerequisite: acceptance into clinical psychology program.
Practicum for first-year students.

745, 746, 747, 748. Clinical Internship. (2 ea.)

Prerequisite: acceptance into clinical psychology program.
Full-time training at approved mental health agency.

755R. Readings and Practicum in Social Psychology. (Arr.)

Faculty-supervised readings and/or internship experience in field setting as arranged by student.

797R. Independent Research. (1-4)

Prerequisite: consent of instructor.
Faculty-supervised research as arranged by student.

799R. Doctoral Dissertation. (1-9)

Concluding research for doctoral program, culminating in final oral examination.

Recreation Management and Youth Leadership

Chair and Graduate Coordinator: Howard R. Gray, 273-CB, 378-4369

Faculty/Specialties

Professors

deHoyos, Benjamin F. (1961) Ph.D., University of Utah, 1969. Research.

Gray, Howard R. (1979) Ph.D., Pennsylvania State University, 1977. Therapy, Gerontology, Research.

Naylor, Jay H. (1959) Ed.D., University of Utah, 1973. Administration.

Thorstenon, Clark T. (1969) Ph.D., University of Utah, 1969. Therapeutic Recreation.

Associate Professors

Catherall, Thomas S. (1971) Ed.D., Brigham Young University, 1980. Youth Research.

Olsen, Burton K. (1965) Ph.D., University of Minnesota, Minneapolis, 1970. Community School.

Skinner, Rulon Dean (1969) M.A., Brigham Young University, 1971. Youth Leadership.

Smith, S. Harold (1988) Ph.D., University of Utah, 1974. Therapeutic Recreation Research.

Assistant Professor

Palmer, Gary K. (1968) Ed.D., Brigham Young University, 1981. Community Research.

Graduate Programs and Degrees

Recreation Management and Youth Leadership (M.A.)
Therapeutic Recreation (M.A.)

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Recreation Management and Youth Leadership (M.A.)
Therapeutic Recreation (M.A.)

Admission and Entry

I. Application Requirements:

A. Deadlines: University deadlines apply.

B. GPA: Minimum of 3.0 for last 60 semester hours of undergraduate work.

II. Prerequisite: Undergraduate major or minor in recreation or youth leadership. Applicants with other backgrounds may be admitted provisionally but must complete selected prerequisite classes.

Requirements for Degree

I. Credit hours:

A. Thesis option (30): 24 course work hours plus 6 thesis hours (RecM. 699R).

B. Internship option (36): 28 course work hours plus 8 internship hours (RecM. 599R).

II. Required courses: Determined in consultation with advisory committee.

III. Minor: Any approved minor.

IV. Thesis or internship.

V. Examination: Oral defense of thesis for thesis option candidates.

Recreation Management Graduate Courses

523. Management of Outdoor Systems. (2)

Administering camps and outdoor programs; site selection and development; program planning and staffing.

570. Aging and Leisure. (2)

Independent Study also.

Understanding recreation and leisure services for the aging and aged in both community and institutional settings.

582. Recreation Facility Planning. (2)

Developing facilities for public and private recreation programs.

583. Park Planning and Development. (2)

585. The Community Education Philosophy. (2)

Independent Study also.

History, organization, funding, leadership, facilities, and value of the community school.

586. Financial Management for Recreation. (2)

How to finance programs and facilities.

599R. Internship. (1–9)

Prerequisite: consent of instructor.

Professional leadership practicum.

610. Research Methods in Recreation. (3)

Preparing research proposals and guidelines for thesis writing.

611. Philosophical Foundations in Recreation. (2)

Historical, cultural, and philosophical foundations of leisure and recreation from the contemporary perspective.

612. Applied Research Techniques. (2)

Statistical tests in recreation management and youth leadership, interpreting statistical data, and computerizing statistical research.

615. Process Facilitation in Recreation. (2)

Identifying and applying various functions and roles of the recreation process facilitator.

619. Needs Assessment in Community Planning. (3)

Prerequisite: RecM. 610.

On-location data analysis and scientific report writing of a professional project.

650R. Seminar in Problems. (1–2)

Problems confronted by recreation management professionals. Maximum of 4 credit hours.

680. Public Relations and Communications in Recreation Management. (2)

Solving human relations problems in recreation management.

685. Community Education Administration. (2)

Administrative problems of leadership, organization, finance, legal aspects, and public relations.

694. Readings in Recreation Literature and Research. (2)

Readings from professional literature; group discussion.

699R. Master's Thesis. (1–9)

Religion

Ancient Scripture

Chair: Robert L. Millet, 124 JSB, 378-2067

Graduate Program

Ancient Scripture Minor

The Department of Ancient Scripture offers a graduate minor but not a graduate major. See the BYU General Catalogue for faculty listings.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program Requirements

Ancient Scripture Minor

Areas of Emphasis: Book of Mormon, Old Testament, New Testament, and Pearl of Great Price.

I. Credit hours:

A. Master's level: 9 approved hours, no more than 2 hours of which may be readings courses.

B. Doctoral level: Minimum of 12 hours determined in consultation with major department chair.

II. Required courses: Determined with approval of Ancient Scripture Department chair. Courses in biblical languages such as Heb. 331 and 531 or Greek 411, 612, and 613 that could strengthen a graduate minor in ancient scripture. Such courses would be in addition to the minimum hours required in religion.

III. Advisory committee: Must include one member from ancient scripture faculty.

IV. Credit limitation: No undergraduate credit may apply.

Ancient Scripture Graduate Courses

501. Analysis of the Old Testament: The Pentateuch and Historical Books. (3)

502. Analysis of the Old Testament: Prophetic Books. (2)

503. Analysis of the Old Testament: Poetic and Wisdom Literature. (2)

510R. Special Topics in Ancient Scripture. (3V)

Prerequisite: seminary and institute personnel only.

Subjects and questions typically addressed by Church Educational System instructors. Cannot apply to a graduate degree.

511. The Gospels. (2)

512. Paul's Life and Letters. (2)

513. The General Epistles and Revelation. (2)

514. Historical Background of the New Testament. (2)

521, 522. Analysis of the Book of Mormon. (3 ea.)

523. External Evidence of the Book of Mormon. (2)

527. History and Doctrines of the Pearl of Great Price. (3)

606. The Apocrypha and Pseudepigrapha. (2)

610R. Graduate Seminar in Ancient Scripture (1–3)

620R. Directed Readings in Ancient Scripture. (1–3)

Prerequisite: graduate standing.

Church History and Doctrine

Chair: Larry E. Dahl, 124 JSB, 378-3691

Graduate Program

Church History and Doctrine Minor

The Department of Church History and Doctrine offers a graduate minor but not a graduate major. See the BYU General Catalogue for faculty listings.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program Requirements

Church History and Doctrine Minor

Areas of Emphasis: Christian history, Doctrine and Covenants, LDS history, LDS doctrine, and world religions.

- I. Credit hours:
 - A. Master's level: 9 approved 9 hours.
 - B. Doctoral level: Minimum of 12 hours determined in consultation with major department chair.
- II. Required courses: Determined with approval of Church History and Doctrine Department chair.
- III. Advisory committee: Must include one member from Church history and doctrine faculty.
- IV. Credit limitation: No undergraduate credit may apply.

Church History and Doctrine Graduate Courses

510R. Special Topics in Church History and Doctrine. (3V)

Prerequisite: seminary and institute personnel only.

Subjects and questions typically addressed by Church Educational System instructors. Cannot apply to a graduate degree.

524, 525. Analysis of the Doctrine and Covenants. (3 ea.)

530. LDS Doctrine. (2)

540R. Special Topics in Church History and Doctrine. (2-3)

Independent Study available to commissioned and prospective chaplains only.

Topics include Joseph Smith's thought, Church doctrine, schismatic movements in Church history, historical setting of the Restoration, comparative American religions, Near Eastern religions, etc.

541. Documents of LDS Church History (1805-1844). (3)

542. Documents of LDS Church History (1844-1900). (3)

543. Documents of LDS Church History (Twentieth Century). (3)

551. History of the Early Church Through the Fourth Century. (3)

552. Medieval and Reformation Christianity. (3)

553. History of the Christian Church Since the Seventeenth Century. (3)

555. Comparative World Religions. (2)

556. Comparative World Religions. (2)

640R. Graduate Seminar in Church History and Doctrine. (1-3)

Topics include the Doctrine and Covenants, LDS Church history, LDS doctrine, Christian history, Christian theology, world religions, etc.

650R. Directed Readings in Church History and Doctrine. (1-3)

Prerequisite: graduate standing and consent of instructor.

Topics include the Doctrine and Covenants, LDS Church history, LDS doctrine, Christian history, Christian theology, world religions, etc.

School of Social Work

Director: Barbara R. Wheeler, 223 KMB, 378-3282

Assistant Director/Graduate Coordinator: John R.

Christiansen, 238 KMB, 378-3211

Fieldwork Educational Director: W. Eugene Gibbons, 216 KMB, 378-7756

Faculty/Specialties

Professors

Blake, Reed H. (1967) Ph.D., Utah State University, 1969.

Social Psychology, Technical Writing, Communication, Disaster Planning.

Christiansen, John R. (1957) Ph.D., University of

Wisconsin, Madison, 1955. Social Psychology, Research Methodology, Family, Disaster Planning.

Gibbons, W. Eugene (1969) D.S.W., University of Utah,

1974. Psychiatric/Clinical Social Work, Family.

Pehrson, K. Lynn (1990) D.S.W., Catholic University, 1980.

Human Behavior, Group Work, Family and Children.

Shumway, E. Gene (1975) D.S.W., Case Western Reserve University, 1969. Clinical Social Work (Individual and Marital Therapy).

Associate Professors

Horton, Anne L. (1984) Ph.D., University of Wisconsin,

Madison, 1983. Clinical Social Work, Marriage and Family, Domestic Violence.

Tanner, Elvin R. (1970) Ph.D., Brigham Young University,

1969. Clinical Social Work, Personal Counseling,

Marriage and Family Systems, Cognitive Therapy.

Wheeler, Barbara R. (1979) D.S.W., University of Utah,

1978. Psychiatric/Clinical Social Work, Marriage and Family Therapy, Children, Women.

Assistant Professors

Norman, Judith L. (1990) D.S.W., University of Utah, 1990.

Psychiatric/Clinical Social Work, Family and Children.

Pearson, Dale F. (1970) Ph.D., Brigham Young University,

1981. Clinical Social Work, Marriage and Family Therapy, Families and Children.

Seipel, Michael M. O (1982) Ph.D., Cornell University,

1982. Social Welfare Policy, Community Organization, Ethnic Studies.

Spaid, Wanda M. (1988) D.S.W., University of Utah, 1989.

Clinical Social Work, Human Behavior, Research Methodology.

Graduate Program and Degree

Social Work (M.S.W.)

Area of Emphasis

Clinical social work with family, youth, and children.

The graduate program is designed to train students who are committed to the general objectives of the profession of social work i.e. to promote the general welfare of society by enhancing the social functioning of individuals, families, groups, organizations, and communities. The basic objective of the M.S.W. program is to help students acquire the knowledge, skills, attitudes, and values that prepare them for advanced clinical practice.

The program offers one method of concentration, i.e., preparation for clinical practice. The emphasis of the curriculum is on family and children. The curriculum design was developed within the framework of systems theory as an integrating concept. The practice courses have been designed to interface the psychosocial approach to social work practice with the systems framework. Such an approach enables the practitioner to be responsive to the special issues of diversity in pluralistic societies such as race, ethnicity, sexism, and cultural differences.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Social Work (M.S.W.)

Program accredited with the Council on Social Work Education.

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 1.
 - B. Entrance examination: At departmental discretion.
- II. Prerequisite: Applicants are expected to have prepared themselves for the M.S.W. program by completing course work and developing a base of knowledge and skill in the following areas:
 - A. Research (5 hours): Research*, statistics*.
 - B. Human biology* (3 hours).
 - C. Behavioral sciences (9 hours): Abnormal behavior*, personality theory, learning theory, child development, family theory, etc.
 - D. Social sciences (6 hours): Social psychology, organizational behavior, social analysis (3); community planning, political science, social legislation, etc. (3).
 - E. Interpersonal skills (6 hours): Communication, casework, group work, intervention skills/theory*, etc.

*Specifically required.

- III. Entry time: Fall semester only.

Requirements for Degree

- I. Credit hours (64): Minimum of 64 course work hours distributed as follows: Social work practice courses (17 hours), human behavior and social environment (10 hours), social welfare policy (6 hours), research (7 hours), professional seminar (2 hours), field practicum (14 hours), electives (8 hours).
- II. Electives: 8 hours, 6 of which are clinical. In addition to the required courses, M.S.W. candidates must select at least one elective from SocW. 638 or 641. The remaining electives may be chosen from among other social work electives. One of the elective classes may be selected from a variety of clinical/family courses outside the school or from other educational opportunities to be negotiated with the faculty advisor.
- III. Research project (SocW. 698R).
- IV. Examination: Oral examination and defense of project.

Program and Degree Resources

Camilla Eyring Kimball Chair of Home and Family Life
Comprehensive Clinic
Family and Demographic Research Institute
Gerontology Resource Center
Women's Research Institute

Social Work Graduate Courses

567. Social Services for the Aging. (2)

Prerequisite: consent of instructor.

Process and impact of social service delivery systems on the aged. Does not count as social work elective.

595R. Directed Readings. (1-3)

Prerequisite: consent of instructor.

600R. Qualitative/Quantitative Research Methodologies. (2)

Overview of scientific method and procedures as they apply to individual graduate research; emphasis on conducting ethical, qualitative, and quantitative research. For majors only.

610. Integration and Application of Research Methods and Statistics to Social Work Practice. (2)

Social and behavioral research methods relative to social work practice, including applications of social statistics. For majors only.

612. Human Behavior and Social Environment 3: Psychopathology. (3)

Prerequisite: Psych. 342 or equivalent, SocW. 620.

Etiology and symptoms of dysfunctional behavior and their effects on the individual, family, and community. For majors only.

620. Human Behavior and Social Environment 1: Individual Development Life Cycle. (3)

Forces influencing individual human development and behavior from birth to death, emphasizing psychological, social, cultural, biological, spiritual, and physical factors. For majors only.

621. Human Behavior and Social Environment 2: Organizations, Institutions, Communities. (2)

Prerequisite: SocW. 620.

Theories associated with complex organizations, social organizations, institutions, and communities relative to macrolevel social work practice. For majors only.

630. Social Welfare Policy 1: A Framework for Analysis, Goal Setting, and Change. (3)

Analyzing and changing social policies and programs. For majors only.

631. (SocW.-FamSc.) Social Welfare Policy 2: Family and Child Law. (3)

Prerequisite: SocW. 630.

The law relative to formation, functioning, and dissolution of families and delivery of social services to them. For majors only.

638. Practice in Child Services. (2) Alt. term

Prerequisite: consent of instructor.

Working with the social service delivery system on problems related to child neglect and abuse, foster care, adoptions, etc.

640. Families at Risk. (2)

Prerequisite: consent of instructor.

Applying social work methods to multiproblem families and families under stress. Specific theory, techniques, and skills, i.e., crisis intervention, networking, etc.

641. Interventive Methods with Children and Adolescents. (2)

Prerequisite: consent of instructor.

Use of interventive methods in treating child and adolescent problems in addition to understanding the reciprocal impact of significant systems, i.e., school, family, peers, church, health.

642. Marriage and Family Theories and Treatment. (2)

Prerequisite: consent of instructor.

Various models of marriage and family treatment; appropriate intervention skills. For majors only.

643. Advanced Marriage and Family Practice. (2)

Prerequisite: SocW. 642.

Advanced methods of intervention with marital dyads, family, and community. For majors only.

644. Clinical Intervention with Special Populations. (2)

Prerequisite: consent of instructor.

Applying core clinical practice skills to distinct groups representing racial, ethnic, and cultural diversity.

645. Theological Perspectives on Social Work Practice. (2)

Prerequisite: consent of instructor.

Interface of religious and social work values, attitudes, and principles.

646. Women's Issues in Social Work Practice. (2)

Prerequisite: consent of instructor.

Social work practice and specific problems and issues associated with the changing expectations and roles of women.

647R. Special Topics in Advanced Clinical Practice. (2)

Prerequisite: consent of instructor.

Course content varies from year to year on basis of current need.

648. Selected Fields of Practice. (2)

Survey of current problems and treatments in social work practice.

649. Evaluative Instruments in Social Work Practice. (2)

Using assessment instruments to guide treatment, evaluate therapeutic outcomes, and conduct practice research.

654R. Field Practicum. (1-3)

Prerequisite: first-year placement.

Practicum in social service agencies with an integrative seminar to examine relationship between theory and practice. For majors only.

655R. Field Practicum. (1-3)

Prerequisite: second-year placement.

Practicum in social service agencies with an integrative seminar to examine relationship between theory and practice. For majors only.

660. Social Work Practice: Casework. (2)

Prerequisite: SocW. 620 or concurrent registration.

Psychosocial assessment of individuals and implementing interventions. Skills laboratory required. For majors only.

661. Social Work Practice: Advanced Casework. (3)

Prerequisite: SocW. 660.

Building on skills acquired in SocW. 660; using different microintervention models and approaches. For majors only.

662. Social Work Practice: Group Work. (2)

Prerequisite: SocW. 620 or concurrent registration.

Structure, function, dynamics, and development of small groups, with special emphasis on group models and group theory. For majors only.

663. Social Work Practice: Advanced Group Work. (2)

Prerequisite: SocW. 662.

Applying group theory to individual and family problems. Role of social workers in group process. Group leadership experience required. For majors only.

664. Social Work Practice: Community Organization. (2)

Prerequisite: SocW. 621 or concurrent registration.

Basic practice theory, tactics, and strategies in working with neighborhoods, communities, and organizations toward planned change. For majors only.

665. Social Work Practice: Introduction to Human Services Administration. (2)

Key managerial functions; administrative theory and selected management techniques. For majors only.

666. Social Work Practice: Advanced Clinical Methods in Assessment/Intervention. (2)

Prerequisite: SocW. 661.

Linking psychosocial assessment with advanced clinical theory, skills, and techniques. For majors only.

693R. Seminar in Professional Philosophy, Values, and Ethics of Social Work Practice. (2)

Philosophical and ethical basis for social work and family therapy practice, including integrative framework for defining and implementing professional practice. For majors only.

698R. Master's Research Project. (1-3)

Prerequisite: SocW. 600R, 610.

Applying research methods to evaluative, experimental, and survey studies in social work. Research report of publishable quality required. For majors only.

Sociology

Chair: J. Lynn England, 894 SWKT, 378-3115

Graduate Coordinator: Stephen Bahr, 820 SWKT, 378-6710

Faculty/Specialties

Professors

- Albrecht, Stan L., Academic Vice President and Associate Provost (1974) Ph.D., Washington State University, 1970. Social Psychology, Research Methodology.
- Bahr, Howard M. (1973) Ph.D., University of Texas, Austin, 1965. Urban Problems, Ethnic Relations.
- Bahr, Stephen J. (1973) Ph.D., Washington State University, 1972. Family, Deviance, Law.
- Chadwick, Bruce A. (1972) Ph.D., Washington University, 1967. Research Methods, Family, Social Change, Sociology of Work.
- Duke, James T. (1963) Ph.D., University of California, Los Angeles, 1963. Sociological Theory, Sociology of Religion.
- England, J. Lynn (1970) Ph.D., University of Pittsburgh, 1971. Theory, Community, Social Impact.
- Heaton, Tim B. (1980) Ph.D., University of Wisconsin, Madison, 1979. Demography, Rural Sociology, Stratification, Family.
- Jacobson, Cardell K. (1981) Ph.D., University of North Carolina at Chapel Hill, 1971. Social Psychology, American Race/Ethnic Relations.
- Kunz, Phillip R. (1968) Ph.D., University of Michigan, 1967. Complex Organization, Population, Family.
- Seggar, John F. (1967) Ph.D., University of Kentucky, Lexington, 1968. Social Organization, Social Psychology, Ethnic Relations.
- Thomas, Darwin L. (1972) Ph.D., University of Minnesota, St. Paul, 1968. Family, Social Psychology, Parent-Child Interaction.
- Warner, W. Keith (1971) Ph.D., Cornell University, 1960. Complex Organization, Social Organization, Rural Sociology, Education.

Associate Professors

- Johnson, Barry L. (1965) Ph.D., University of North Carolina, 1977. Statistics, Medical Sociology, Research Methods.
- Johnson, Richard E. (1976) Ph.D., University of Washington, 1976. Deviance, Criminology, Juvenile Delinquency.
- Spencer, Berkley A. (1969) Ph.D., Cornell University, 1967. Development, Latin American Studies, Planned Change.

Assistant Professors

- Barber, Brian (1990) Ph.D., Brigham Young University, 1987. Sociology of the Family.
- Cornwall, Marie (1986) Ph.D., University of Minnesota, 1985. Religion, Family, Research.

Young, Lawrence A. (1985) Ph.D., University of Wisconsin, Madison, 1989. Complex Organization, Religion, Education.

Graduate Programs and Degrees

Sociology (M.S.)
Family Studies (Ph.D.)
Sociology (Ph.D.)

Areas of Emphasis

Demography, family sociology, social organization, social psychology.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Sociology (M.S.)

Students who are interested in pursuing the master's degree in sociology should direct inquiries to the Department of Sociology for advisement and a broader description of the program.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: February 15 for all those requesting financial assistance. University deadlines apply for those who do not require financial assistance.
 - B. Entrance examination: GRE encouraged but not required.
- II. Prerequisite: Baccalaureate degree in sociology or equivalent.

Requirements for Degree

- I. Credit hours (30): Minimum of 24 course work hours, including at least 15 hours of formal course work in sociology; plus 6 hours of thesis (Soc. 699R) or 6 hours of project (Soc. 698R).
- II. Required courses: Soc. 600, 606, 611; 620 or 650.
- III. Demonstration of competence in sociological theory, research methods, and statistics.
- IV. Thesis or research project: Students who plan to pursue a doctoral degree or other graduate work should complete a thesis. Students who pursue the research project option are using the master's degree as a terminal degree and cannot apply for further graduate work in sociology.
- V. Examination: Oral defense of thesis or project.

Sociology (Ph.D.)

Family Studies (Ph.D.)

Students who desire a Ph.D. in sociology may pursue either the regular sociology program or the family studies program. Students in the regular sociology program may emphasize social organization, social psychology, race relations, deviant behavior, or demography. The family studies program is a joint Ph.D. program between the Sociology Department and the Family Sciences Department. Students who plan to specialize in family sociology should take the family studies option, and students who plan to choose other fields should take the regular sociology option. Please direct inquiries to the Department of Sociology for a broad description of the program.

Admission and Entry**I. Application requirements:**

A. **Deadlines:** For family studies program, February 1. For sociology program, February 15 for all those requesting financial assistance; university deadlines apply for all those who do not.

B. **Entrance examination:** GRE encouraged but not required.

II. **Prerequisite:** Master's degree in sociology or equivalent; master's thesis.

III. **Entry times:** Fall semester.

Requirements for Degree

I. **Credit hours (66 plus skill):** 48 hours of approved course work, plus 18 dissertation hours (Soc. 799R) and the skill requirement. Only course work with a grade of B- or better is acceptable.

II. **Required courses:** Soc. 706, 711; minimum of 6 hours selected from Soc. 601, 602, 604, 608; minimum of 9 hours in each of two specialty areas selected for comprehensive examinations.

III. **Demonstration of competence at the doctoral level** by required course work and by examination in sociological theory, research methods, and statistics.

IV. Language/ Skill requirement:

A. **Single language option:** In-depth proficiency.

B. **Two languages option:** Reading ability.

C. **One language and skill option:** Reading ability in French, German, Spanish, or Russian; 8-10 hours of statistics, computer science, and mathematics, or of Soc. 400, 504, 700, 706; FamSc. 602; Psych. 570.

D. **Single skill option:** Minimum 18 hours, approved by advisory committee, of statistics, computer science, and mathematics, or of courses listed in option C.

V. **Dissertation.**

VI. Examinations:

A. **Written comprehensive examination** in two of the following areas of specialization: family sociology, social psychology, social organization, and demography.

B. **Oral defense of dissertation prospectus.**

C. **Oral defense of dissertation.**

Program and Degree Resources

Center for Studies of the Family
Women's Research Institute

Sociology Graduate Courses**503. Advanced Social Science Computing. (3)**

Prerequisite: Soc. 303 or 400 or consent of instructor.

Appropriate use of computer technology and software in social science scholarship and research: data acquisition and management, advanced statistical methods, computer information retrieval and exchange.

504. Mathematical Sociology. (3) On dem.

Prerequisite: Math. 105.

Mathematical techniques of simulating and modeling social processes.

515. Seminar in Applied Sociology. (3)

Prerequisite: Soc. 315, 600, 606, 610.

Uses of sociological theory and methods to deal with individual, organizational, and societal problems. Techniques for communicating such knowledge to the non-sociologist.

524. Advanced Political Sociology. (3)

Social basis of political behavior. Modern theories and research concerning use of power and decision making.

525. Sociology of Religion. (3) On dem.

Prerequisite: Soc. 111, 325, or consent of instructor.

Influences of social factors in the development of various religious systems.

527. Sociology of the LDS Church and Its People. (3)

The LDS Church from a social science perspective, including the Church as a new religious movement, LDS culture, the institutionalization process.

530. Sociology of International Development. (3)

Major theoretical paradigms of development with strategies and practical application in the international setting.

545. Population Analysis. (3) On dem.

Prerequisite: Soc. 205 or equivalent.

Availability, use, and interpretation of population data for local, state, and national areas applied to planning and evaluation.

560. (Soc.-FamSc.) Contemporary Theories About the Family. (3) On dem.

Contemporary theories and research about the family, emphasizing role, exchange, and systems theories.

561. The Family Institution. (3) On dem.

The family in different societies; problems created by various family systems.

565. Sociology of Aging. (2) On dem.

Demographic and societal factors affecting aging. Agencies serving older citizens and role of the community in resolving problems of the aged.

590R. Special Topics in Sociology. (1-3)

Prerequisite: consent of instructor.

Course content varies from year to year.

595R. Directed Readings. (1-3)

Individualized reading program supervised by faculty member. Pass/Fail only.

600. (Soc.-FamSc.) Advanced Research Methods. (3)

Prerequisite: Soc. 300 or equivalent.

Training in survey, experimental, secondary, and content analysis; qualitative, evaluation, and environmental impact research techniques.

601. (Soc.-FamSc.) Seminar in Survey Research. (3) On dem.

Prerequisite: Soc. 600 or equivalent.

Survey research techniques of the behavioral sciences; emphasizes research and sampling designs.

602. (Soc.-FamSc.) Experimental Design. (3) On dem.

Prerequisite: Soc.-FamSc. 600, Stat. 501 or equivalent, or consent of instructor.

Research methods, logic, writing, and data analysis.

603R. (Soc.-FamSc.) Research Practicum. (3) On dem.
Prerequisite: consent of instructor.

Design, data collection, data analysis, and write-up.

604. Ethnographic Research Techniques. (3)
Prerequisite: Soc. 600.

Rationale, methods, and limitations of qualitative research; includes participant observation and hermeneutic skills.

606. Intermediate Statistics. (3)
Prerequisite: Soc. 205 or equivalent, concurrent or prior registration in Soc. 303 or 400.

Probability, estimation, hypothesis testing, correlation analysis, multiple regression, analysis of variance, and nonparametric methods for sociologists and other social scientists.

608. Sociological Measurement. (3)
Prerequisite: Soc.-FamSc. 600, Soc. 606.

Unidimensional and multidimensional measurement techniques, emphasizing theoretical, methodological, and substantive consequences of technique selection.

611. Seminar in Contemporary Sociological Theory. (3)
Prerequisite: Soc. 311.

Contemporary theories: structural functionalism, conflict theory, exchange theory, and symbolic interactionism.

612. Seminar in the Development of Sociological Theory. (3) On dem.
Prerequisite: Soc. 610.

Contributions of sociological theorists, including Durkheim, Weber, Pareto, and Simmel.

620. Theory and Research in Social Organization. (3) On dem.
Prerequisite: admission to graduate sociology programs; others by consent of instructor.

Graduate survey of the field of social organization and the core subfields therein.

621. Complex Organizations. (3) On dem.
Prerequisite: consent of instructor.

Theoretical approaches and empirical studies of organizations, their structures, processes, and problems; studies of industrial organizations, universities, hospitals, etc.

622. Social Stratification. (3) On dem.
Prerequisite: Soc. 111.

Status, class, and power systems in various societies.

623. Seminar in Race and Ethnic Relations. (3) On dem.
Major theories of race-ethnic relations; critical issues in the field.

630. (Soc.-Psych. 655) Attitude Measurement and Change. (3) On dem.
Prerequisite: consent of instructor.

Attitude development, change, and assessment, focusing on both individual and mass persuasion.

650. Advanced Social Psychology. (3) On dem.
Processes of social influence, emphasizing theory and research testing. Basic principles of social behavior.

660. (Soc.-FamSc.) Parent-Child Interaction. (3)
Socialization of children in families, focusing on parent-child relationships from infancy through adolescence. Current theory and empirical research emphasized.

670. Contemporary Urban Social Structure. (3) On dem.
Prerequisite: Soc. 370.

Research-oriented examination of social forces in contemporary urban life that influence patterns of human interaction.

681R. Seminar in Deviance, Crime, and Corrections. (3) On dem.
Prerequisite: Soc. 380, 381 or 383, or consent of instructor.
In-depth analysis of current issues in the field. Tailored to student interests.

692R. (Soc.-FamSc.) Seminar in Family Relationships. (3)
Prerequisite: Soc.-FamSc. 560.

Theory and research in topical areas of family study (topics presented on alternate years): Marital stability, power and gender roles, marital quality and communication, family and religion, household and family demography.

697R. Directed Research. (1-3) On dem.

698R. Master's Project. (1-6)
Scholarly research or development project; demonstrates student's ability to use sociological concepts.

699R. Master's Thesis. (1-6)

706. Advanced Statistical Methods. (3)
Prerequisite: Soc. 606.
Advanced multivariate analysis; analysis of variance and covariance, multiple regression, linear models, latent variables, log-linear models, event history analysis.

711. Sociological Theory and Theory Building. (3)
Prerequisite: Soc.-FamSc. 600, Soc. 606, 610.
Latest contributions to theory; current endeavors in the construction of sociological theories.

720R. Seminar: Social Organization. (1-3) On dem.
Prerequisite: Soc. 111, 620.

750. Seminar: Social Psychology. (3) On dem.
Prerequisite: Soc.-Psych. 650 and consent of instructor.

792R. (Soc.-FamSc.) Family Symposium. (0.5)

799R. Doctoral Dissertation. (1-9)

Statistics

Chair: Leland J. Hendrix, 230 TMCB, 378-4505
Graduate Coordinator: Del T. Scott, 230-B TMCB, 378-7054

Faculty/Specialties

Professors

Bryce, Gale Rex (1972) Ph.D., University of Kentucky, Lexington, 1974. Industrial Quality Improvement.
Carter, Melvin W. (1961) Ph.D., North Carolina State University, Raleigh, 1956. Design and Analysis.
Christensen, Howard B. (1967) Ph.D., North Carolina State University, Raleigh, 1975. Nonparametrics and Sample Design.

Hendrix, Leland J. (1967) Ph.D., Brigham Young University, 1967. Experimental Design, Computer Applications.

Hilton, H. Gill (1962) Ph.D., North Carolina State University, Raleigh, 1962. Experimental Design.

Rencher, Alvin C. (1963) Ph.D., Virginia Polytechnic Institute, 1968. Multivariate Analysis.

Richards, Dale O. (1963) Ph.D., Iowa State University of Science and Technology, 1963. Industrial Statistics, Quality Control, Reliability, Distributions.

Scott, Del T. (1977) Ph.D., Pennsylvania State University, 1977. Statistical Computations, Categorical Data Analysis, Linear Models.

Tolley, H. Dennis (1983) Ph.D., University of North Carolina, 1974. Biostatistics, Actuarial Science.

Associate Professors

Beus, Gary B. (1967) Ph.D., Virginia Polytechnic Institute, 1968. Statistical Education, Quality Control.

Collings, Bruce J. (1988) Ph.D., University of North Carolina, 1981. Analysis of Count Data, Biostatistics, Combinatorics, Computational Statistics, Design of Experiments.

Assistant Professors

Fellingham, Gilbert W. (1990) Ph.D., University of Washington, 1990. Biostatistics, Longitudinal Data Analysis.

Lawson, John S. (1986) Ph.D., Polytechnic Institute of New York, 1984. Industrial Statistics and Experimental Design.

Graduate Program and Degree

Statistics (M.S.)

Areas of Emphasis

Experimental design applications in science and in industry, health care applications; problems in analysis such as nonorthogonality, large data sets, categorical data, etc.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements

Statistics (M.S.)

This program is designed to prepare students for work in industry and government or Ph.D. work in statistics.

Admission and Entry

- I. Application requirements:
 - A. Deadlines: University application deadlines apply.
 - B. Entrance examinations: General GRE (Q, V, A) and subject GRE (advanced mathematics). Every international applicant whose native language is not English is required to submit TOEFL scores.
- II. Prerequisite:
 - A. Stat. 321, 322, 341, 411; 337 or 501; Math. 343, 344; CS 131 (C and F), 142 or 231; or equivalents to any of these.

B. Students whose native language is not English may be required to take one or more ESL classes, depending on the outcome of an interview with the department.

- III. Entry times: All semesters for students with B.S. degree in statistics; fall and spring for others.

Requirements for Degree

- I. Credit hours (30): Minimum 24 course work hours plus 6 thesis hours (Stat. 699R).
- II. Required courses: Stat. 520, 521, 522, 531, 591R, 592, 636; three courses from Stat. 534, 536, 537, 611, 621, 631, 662, 690R.
- III. Minor: Any approved minor.
- IV. Thesis.
- V. Examinations:
 - A. Methods qualifying examination (Stat. 222, 322, 336, 337; or 322, 501, 502) and a theory qualifying examination (Stat. 321, 322, 341, 520).
 - B. Oral examination on course work.
 - C. Oral defense of thesis.

Statistics (M.S. Minor)

Requirements

- I. 9 hours in statistics courses numbered 300 or above except 552 and 554. (A maximum of 3 hours of 300–400 level may apply toward a graduate minor.)
- II. Methods qualifying examination: Stat. 222, 322, 336, 337; or 322, 501, 502.

Statistics (Ph.D. Minor)

Requirements

- I. Stat. 520, 521.
- II. 9 additional hours from statistics courses 500 and above except Stat. 501, 552, 554.
- III. Methods qualifying examination (Stat. 222, 322, 336, 337; or 322, 501, 502) and a theory qualifying examination (Stat. 321, 322, 341, 520).

Statistics Graduate Courses

501. Statistics for Research Workers 1. (5) F, W, Sp
Prerequisite: Math. 110 or equivalent. Recommended: concurrent registration in Stat. 211, 322.

Probability, estimation, tests of hypotheses, regression, analysis of variance, and nonparametric methods. For natural or social science students.

502. Statistics for Research Workers 2. (5) W, Su
Prerequisite: Stat. 501 or equivalent.

Analysis of covariance, multiple regression, linear models, design of experiments, and sampling. For natural or social science students.

520, 521. Theory of Statistics 1, 2. (3 ea.) F, W
Prerequisite: Math. 344, Stat. 321, 341.

Development of the theory of discrete and continuous distribution functions, including derived sampling distributions; tests of hypotheses, and point and interval estimation.

522. Theory of Linear Models. (4) F

Prerequisite: Stat. 322, 520, Math. 343.

Linear hypotheses, with application to regression and design.

531. Experimental Design. (3) W

Prerequisite: Stat. 337 or 501.

Randomized blocks, Latin squares, factorial designs, fractional replication, confounding, and incomplete blocks.

532. Statistics for Scientists. (3) On dem.

Prerequisite: Math. 215 or 344; Stat. 321 or 361.

Analysis of variance, simple and multiple linear regression, randomized blocks, Latin squares, incomplete block designs, factorial designs, confounding, fractional factorial designs, and response surface methodology.

534. Sampling. (3) F even yrs.

Prerequisite: Stat. 334, 337, or equivalent.

Estimation in systematic, simple random, stratified, cluster, PPS sampling, and mixtures of these; ratio estimation; sample size determination and principles of sample allocation.

536. Regression Analysis. (3) F

Prerequisite: Stat. 322; 336 or 501.

Multiple regression, introduction to model building and nonlinear estimation, examination of residuals, stepwise regression, subset selection procedures, biased estimation, and model validation.

537. Categorical Data Analysis. (3) W

Prerequisite: Stat. 337 or 502.

Analysis of multiway contingency tables with linear and log-linear models using maximum likelihood and minimum modified chi-square estimates as appropriate.

541. Advanced Probability. (3) On dem.

Prerequisite: Math. 215 or 344, Stat. 341.

Advanced combinatorial methods, random walk, Markov chains, and stochastic processes.

545. Stochastic Processes. (3) On dem.

Prerequisite: Stat. 421 or 520.

Development of stationary Gaussian and Poisson processes, including moments correlation and spectral representation. Applications to modulation, Markov processes, mean square estimation, and spectral estimation.

552. Statistical Methods in Education 1. (3) F, W, Sp, Su

Prerequisite: Math. 100 or equivalent.

Measures of central tendency, variability; correlation; simple linear regression; introduction to hypothesis testing and estimation. Computer applications. For graduate majors in education and related fields.

554. Statistical Methods in Education 2. (3) W, Su

Prerequisite: Stat. 552.

Applications of analysis of variance and covariance, multiple regression, correlation, and nonparametric methods. Introduction to experimental design. For graduate majors in education and related fields.

591R. Graduate Seminar in Statistics. (0)

592. Statistical Consulting. (1)

599R. Cooperative Education: Statistics. (2-9)

Prerequisite: consent of department coordinator.

On-the-job experience. Report required.

611. Multivariate Statistical Methods. (3) W

Prerequisite: Stat. 322; 337 or 502.

Inference about mean vectors and covariance matrices; multivariate analysis of variance and regression; canonical correlation; discriminant analysis; principal component analysis; factor analysis.

621. Advanced Theory of Statistics. (3) On dem.

Prerequisite: Math. 344, Stat. 521.

Theory of estimation, testing hypotheses, multiple regression, and multivariate analysis.

631. Advanced Experimental Design. (3) Odd yrs.

Prerequisite: Stat. 321, 531.

Confounding and fractional replication in general symmetric and asymmetric factorial designs, response surface methods, mixture designs, and optimal designs.

636. Advanced Statistical Methods. (3) F

Prerequisite: Stat. 321, 322; 502 or 531.

Analysis of variance with unequal subclass frequencies, including missing cells; analysis of covariance; orthogonal polynomials; multiple comparisons and related topics.

662. Advanced Industrial Statistics and Reliability. (3)

On dem.

Prerequisite: Stat. 321, 462; Math. 215 or 344.

Sequential sampling, tolerance limits, life testing, and reliability.

690R. Advanced Special Topics. (3) F, W, Sp, Su

Prerequisite: consent of instructor.

695R. Readings in Statistics. (1-3) F, W, Sp, Su

Prerequisite: departmental approval.

699R. Master's Thesis. (1-6) F, W, Sp, Su

Prerequisite: departmental approval.

Theatre and Film

Chair: Harold R. Oaks, D-581 HFAC, 378-6645

Graduate Coordinator: Robert A. Nelson, F-466 HFAC, 378-3406

Faculty/Specialties

Professors

Bentley, Marion J. (1971) Ph.D., University of Utah, 1968.

Directing, Acting, Dialects, Theatre History.

Henson, Charles A. (1958) Ed.D., Brigham Young University, 1980. Set Design, Theatre Management, Lighting Design.

Metten, Charles L. (1962) Ph.D., University of Iowa, 1960.

Film History, Theory and Criticism, Directing, Acting.

Oaks, Harold R. (1970) Ph.D., University of Minnesota, Minneapolis, 1964. Child Drama, Children's Theatre, Puppetry, Directing.

Pope, Karl T. (1966) Ph.D., Wayne State University, 1966.

Set and Lighting Design, Technical Theatre.

Whitman, Charles W. (1965) Ph.D., University of Minnesota, Minneapolis, 1967. Music Dance Theatre, Acting, Directing, Playwriting.

Woodbury, Lael J. (1965) Ph.D., University of Illinois, 1954.
Theatre History, Dramatic Theory and Criticism.

Associate Professors

D'Arc, James V. (1985) Ph.D., Brigham Young University,
1986. Film History.

Jenkins, Jean R. (1967) M.A., Brigham Young University,
1966. Interpretation, Voice and Speech, Storytelling.

Nelson, George D. (1990) M.F.A., University of
Washington, 1979. Secondary Education, Child Drama.

Nelson, Robert A. (1977) Ph.D., University of Utah, 1976.
Acting, Directing, Theatre History, Dramatic Theory
and Criticism.

Scanlon, Rory R. (1984) M.F.A., University of Illinois, 1984.
Set and Costume Design, Costume History, Lighting
Design.

Assistant Professors

Crosland, Ivan A. (1971) M.A., Brigham Young University,
1965. Acting, Directing.

Heiner, Barta (1988) M.F.A., American Conservatory
Theatre, 1977. Acting, Directing.

Johnson, Peter N. (1982) M.A., Brigham Young University,
1972. Film Production.

Scheerer, David E. (1989) M.F.A., Brigham Young
University, 1986. Film Production.

Swenson, Janet L. (1974) M.A., Brigham Young University,
1974. Costume Design, Costume History, Makeup.

Swenson, Sharon (1987) Ph.D., University of Utah, 1991.
Film History, Theory, Criticism.

Walker, Oscar Lee (1969) M.I.E., Brigham Young
University, 1975. Technical Theatre, Stage Management.

Graduate Programs and Degrees

Theatre and Film (M.A.)

Film (M.F.A.)

Theatre Design and Technology (M.F.A.)

Theatre and Film (Ph.D.)

Areas of Emphasis

Theatre, film, child drama, history, and theory.

General University Requirements

See General Information section of this catalogue for uni-
versity requirements that apply to all departments.

Program and Degree Requirements

Theatre and Film (M.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 15.
 - B. Entrance examination: General GRE; scores sub-
ject to review.
 - C. Samples of written work, demonstrating the
capacity to function at an acceptable graduate
student entry level.
- II. Prerequisite: Accepted undergraduate background
in theatre arts or film.
- III. Entry times: Fall semester and summer term.

Requirements for Degree

- I. Credit hours (32): Minimum 26 course work hours
plus 6 thesis hours (ThF. 699R). Minimum of 20
hours must be in theatre/film or theatre/film-
related courses.
- II. Required courses: ThF. 690; 9 hours in graduate-
level history, theory, and criticism—either 3 hours in
film and 6 in theatre, or 6 hours in film and 3 in thea-
tre, depending upon area of emphasis.
- III. Minor: Any approved minor, but none is required.
- IV. At least one significant production experience, deter-
mined in consultation with advisory committee.
Evaluation will occur immediately after the produc-
tion.
- V. Thesis: Thesis must make a genuine contribution to
the body of knowledge and meet the highest aca-
demic standards. (Departmental style sheets are
M.L.A. and Turabian.) Thesis prospectus must be
defended publicly at least six months before gradua-
tion. Three kinds of thesis research will be accepted:
(1) scholarly analysis of theatre, film, or television
history, theory, or criticism; (2) research and strong
creative achievement in theatre or film production,
or education; (3) measurement studies.
- VI. Final examinations:
 - A. Comprehensive written examination.
 - B. Oral defense of thesis.

Film (M.F.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 15.
 - B. Entrance examination: General GRE; scores sub-
ject to review.
 - C. Résumé and portfolio of film and written work.
 - D. Interview with area committee.
- II. Prerequisite: Bachelor of arts degree including the
following courses or their equivalents: ThF. 117, 123,
188, 202, 288, 361, 480R, 487R, 489R. Equivalencies to
be determined by film faculty.
- III. Entry time: Fall semester.

Requirements for Degree

- I. Credit hours (60): Minimum 60 hours, including 3–6
project hours (ThF. 698R).
- II. Required courses: ThF. 583R, 584, 585R, 586R, 589,
599R, 674R, 680R, 681R, 685R, 690, 788R; 6 hours
from 587R, 687R, 688R, 689.
- III. Electives (4–10 hours): To be selected in consultation
with advisory committee.
- IV. Project (3–6 hours; ThF. 698R). All projects must be
reported in thesis form and accepted by film faculty.
 - A. Option 1: Completed, directorially competent 16-
mm film or video production from an original
script.
 - B. Option 2: Original feature-length screenplay, a
budget for that screenplay, a "director's note-
book," and the actual production (on film or
tape) of three to five of the key dramatic scenes
from that screenplay.
- V. Final examinations:
 - A. Comprehensive written examination.

- B. Oral defense of project.

Theatre Design and Technology (M.F.A.)

Admission and Entry

- I. Application requirements:
 - A. Deadline: February 15.
 - B. Entrance examination: General GRE; scores subject to review.
 - C. Résumé and portfolio.
 - D. Interview with area committee.
- II. Prerequisite: The following courses or their equivalents: ThF 116, 117, 121, 123, 127R, 140, 141R, 143R, 200, 201, 220, 361, 461; Art 108, 422, 433R; CITx. 145, 245, 345.
- III. Entry time: Fall semester.

Requirements for Degree

- I. Credit hours (60): Minimum 60 course work hours, including 6 project hours (ThF. 698R).
- II. Required courses: ThF. 520, 544R, 595R, 599R, 600, 601, 662R, 668, 674R, 690, 698R, 731, 732, 797R.
- III. Electives: 15 hours selected from the following in consultation with advisory committee: ThF. 519, 541R, 542R, 544R, 545R, 562, 670, 678, 697R; Art 600R, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610; CITx. 545.
- IV. Off-campus internship (ThF. 599R).
- V. Project (minimum 6 hours; ThF. 698R): Design and supervision of scenery, lighting, or costumes for at least one full-length production. Must be reported in thesis form and accepted by area committee.
- VI. Final examinations:
 - A. Comprehensive written examination.
 - B. Oral defense of project.

Theatre and Film (Ph.D.)

Admission and Entry

- I. Application Requirements:
 - A. Deadline: February 15.
 - B. Entrance examination: General GRE; scores subject to review.
 - C. Samples of written work, demonstrating the capacity to function at an acceptable doctoral student entry level.
- II. Prerequisite: Acceptable master's degree in theatre or film.
- III. Entry times: Fall semester and summer term.

Requirements for Degree

- I. Credit hours beyond bachelor's degree (78): Minimum of 45 hours in theatre and film; 15 hours in approved minor; 18 dissertation hours (ThF. 799R). (Language/Skill requirement not included here.)
- II. Required courses: ThF. 690; 15 hours in graduate-level history, theory, and criticism—either 6 hours in film and 9 in theatre, or 9 hours in film and 6 in theatre, depending upon area of emphasis.
- III. Language/Skill requirement, to be certified by the appropriate language department:

- A. Option 1: One language, in depth (reading and speaking ability). Demonstrate thorough familiarity with French, German, Russian, or Spanish in one of following ways.

1. Complete minimum of 22 semester hours in the language with grade of B (3.0) or higher.
2. Earn first 16 of these hours by special examination; register for remaining credit from language courses 321, 322, or equivalent.
3. Take a special examination from language department that will test ability (a) to translate literature in field competently and (b) to communicate orally in language.

- B. Option 2: Two languages (reading ability). One must be French, German, Russian, or Spanish. Second language may be any language approved by department and authorized by Graduate Council. Requirement can be met in either of the following ways:

1. Take special examination from language department that will test ability to translate literature in field competently.
2. Complete 16 semester hours of credit with average grade of B (3.0) in languages selected.
- C. Option 3: One language (reading ability) and one skill subject. Include one of languages in second option listed above plus 8–10 hours of computer science, mathematics, and/or statistics as approved by Graduate Council. Mathematics hours must be beyond Math. 111.

- IV. At least one significant production experience, as determined in consultation with advisory committee. Evaluation will occur immediately after production experience.
- V. Dissertation: Dissertation must make a genuine contribution to the body of knowledge and meet the highest academic standards. (Departmental style sheets are M.L.A. and Turabian.) Dissertation prospectus must be defended publicly at least six months before graduation. Three kinds of dissertation research will be accepted: (1) scholarly analysis of theatre, film, or television history, theory, or criticism; (2) research and strong creative achievement in stage or film production, or education; and (3) measurement studies.
- VI. Final examinations:
 - A. Comprehensive written examination.
 - B. Oral defense of dissertation.

Theatre and Film Graduate Courses

516R. Theatre and Film Instruction. (1–6) Alt. term.
Prerequisite: consent of instructor.

Master class for developing teaching methods and techniques for use in departmental theatre and film courses.

519R. Stage Management 2. (1–3) Alt. term
Prerequisite: ThF. 319 or equivalent.

Advanced principles, techniques, and experiences in stage management. Production stage managers chosen from this course.

520. Scenic Design 2. (3)

Prerequisite: ThF. 140, 220, or consent of instructor.

Intermediate theory and practice of scenic design for the stage.

522R. Auditions and the Business. (3)

Prerequisite: ThF. 124R, 323R, 324R.

Auditions, cold reading, resumés, and the business end of acting, music, and dance for the professional performer.

523R. Acting: Recital. (2)

Prerequisite: ThF. 124R, 323R, 324R.

Twenty-five to thirty-minute performance of cuttings from varied genres.

524R. Acting: Advanced Performance. (3)

Prerequisite: ThF. 124R, 323R, 324R.

Performance option: performance and written analysis of approved role in a major production. Teaching option: assistance in acting classes and weekly seminar.

526. Sound Design 2. (2)

Prerequisite: ThF. 220, 326, or equivalent.

Sound theory, practice, and methodology of studio recording, reinforcement, and mixing.

527. Storytelling. (2) Alt. sem., Alt. term

Theory, technique, and practice.

540R. Workshop 2: Acting. (1-6)

Prerequisite: consent of instructor.

Advanced experience in production: acting.

541. Set Construction 3. (3)

Advanced experience in production: construction.

542R. Theatre Production 3. (1-3)

Prerequisite: 143R, 343R, or equivalent.

Advanced experience in production: technical crew.

543R. Workshop 2: Directing. (1-6)

Prerequisite: consent of instructor.

Advanced experience in production: directing.

544R. Workshop: Design. (1-6)

Prerequisite: consent of instructor.

Advanced experience in production: design.

545R. Costume Construction 3. (1-6)

Prerequisite: ThF. 543R, 544R, or consent of instructor.

Special construction: armor, masks, etc.

552R. Creative Dramatics and Improvisation. (3) W, Alt. Su

Informal or improvised dramatic techniques with children, adolescents, and/or adults.

562. Costume Design 3. (3) W, Alt. term

Prerequisite: ThF. 220, 362, 462, 544R, 595R, or consent of instructor.

Advanced theory and practice in costume design for stage and screen.

572R. Theatre for Children. (2)

Theories, techniques, and experience in creating formal drama for the child and youth audience.

578R. Advanced Playwriting. (2-6) F, W, Alt. term

Prerequisite: ThF. 378R.

Seminar in playwriting; individual consideration of manuscripts, professional orientation.

579R. Playwright's, Director's, Actor's Workshop. (4)

Prerequisite: by audition only.

"Family" of professionally oriented artists probing new work through script study, improvisations, and production.

581. Art Direction. (3) Alt. yr.

Prerequisite: ThF. 480R or equivalent, and consent of instructor.

Fundamentals of motion picture/television art—direction, design, and technical backup.

582R. Film Postproduction Sound. (3)

Prerequisite: ThF. 482.

Advanced theories, techniques, and practices of film postproduction.

583R. Film Editing 1. (3)

Prerequisite: ThF. 480R, or equivalent, and consent of instructor.

Basic comprehension of film-editing process, including theory and practical experience.

584. Film Sound. (3)

Prerequisite: ThF. 480R, or equivalent, and consent of instructor.

Overall study of motion picture sound recording and theory.

585. Screenwriting 1. (3)

Prerequisite: ThF. 117, 123, 480R, or equivalent, and consent of instructor.

Theory and technique of writing dramatic screen plays.

586R. Cinematography. (3)

Prerequisite: ThF. 480R or equivalent, and consent of instructor.

Lecture, demonstrations, and hands-on experience covering script interpretation, composition cameras, exposure, lighting, and styles of film.

587R. Film Genres. (3)

Intensive study of major film genres: western, musical, propaganda, and comedy.

595R. Workshop 2: Special Projects. (1-6)

Advanced experience in production: special projects.

599R. Cooperative Education. (1-9)

Prerequisite: consent of instructor.

Off-campus experience in stage, film, or television writing, directing, acting, designing, or managing.

600. Advanced History 1: Theatre. (3) Alt. F, Alt. Sp

Prerequisite: ThF. 200, 201.

Primitive and classical theatre through seventeenth century.

601. Advanced History 2: Theatre. (3) Alt. W, Alt. Su

Prerequisite: ThF. 200, 201.

Theatre during eighteenth through twentieth centuries.

644. Advanced Scenic Design. (3)

Prerequisite: ThF. 140, 220, 340R, 520, or equivalent.

Advanced theory and practice in setting design for stage.

660R. Advanced Voice and Interpretation. (3)

Prerequisite: ThF. 121, 122, 123, 325R.

Continuation of ThF. 325R. Polishing vocal and interpretative skills through performances.

662R. Seminar in the Theory and History of Theatrical Costuming. (3) F, Alt. Su

Prerequisite: ThF. 220, 295R, 362, 544R, 562, 595R, or equivalent.

Major movements in costume and evolution of costuming theory, providing strong research and design experience.

664. Theatre Management 1. (2)

Theory and practice, including play selection, budget, and promotion.

665. Theatre Management 2. (2)

Theory and practice, including box office, theatre plant, and personnel.

668R. Special Studies in Theatre, Film, or Television. (1-3)

Supervised research in selected historical, theoretical, or critical problems.

670. Advanced Set Construction. (3)

Prerequisite: ThF. 140, 340, 541, or equivalent.

Special problems in scenery construction and rigging.

671R. Advanced Directing. (3) F, Alt. term

Prerequisite: ThF. 200, 201, 361, 461, or equivalent.

Theories and techniques of directing for the stage through directing projects for public presentation.

674R. Projects in Theatre and Film. (1-4) Supervised applied theory in playwriting/screenwriting, directing, acting, criticism, stagecraft, etc.

677R. Film Production Administration. (2)

678. Advanced Stage Lighting. (3)

Prerequisite: ThF. 142, 220, 321, or equivalent.

Theory and techniques of theatrical lighting.

680R. Film Production 2. (5)

Prerequisite: ThF. 480R, 583R, 584, 585R, 586, or equivalent and consent of instructor.

Advanced filmmaking production course.

681R. Film Production and Distribution. (3)

Introduction to independent and studio production including packaging, funding, negotiating, distributing, and concluding sale arrangements.

685R. Screenwriting 2. (3)

Prerequisite: ThF. 585 and consent of instructor.

Advanced practical experience in screenwriting.

687R. Motion Picture Directors. (3)

In-depth study of representative body of motion pictures by one major film director such as John Ford, Howard Hawks, Ingmar Bergman, or Woody Allen.

688R. The American Motion Picture. (3)

In-depth study of American motion picture as an art form and as an industry.

689. Motion Picture History. (3)

Worldwide survey of advanced motion picture history.

690. Introduction to Graduate Studies in Theatre and Film. (3) F, Alt. Su

Required of all graduate students during first semester or first term of registration that class is offered.

697R. Seminar and Production: Special Theatre Forms. (2-3)

Prerequisite: consent of instructor.

Theory and practice directing in special forms: readers theatre, avant-garde, etc.

698R. Master's Project. (1-6)

699R. Master's Thesis. (1-9)

700R. Master Seminar. (3) Annually

Selected topics.

731. Dramatic Theory and Criticism 1. (3) Alt. F, Alt. Sp

Development from beginning to nineteenth century.

732. Dramatic Theory and Criticism 2. (3) Alt. W, Alt. Su

Development from nineteenth century to present.

772R. Seminar in Child Drama. (3)

Prerequisite: ThF. 552R, 572R, or consent of instructor.

Advanced theory and research in drama and theatre with and for children.

788R. Symposium for Filmmakers. (3)

Prerequisite: ThF. 388, 480R, 589, previous or concurrent registration in ThF. 680R, and consent of instructor.

Symposium to stimulate and enhance perception and understanding of motion picture industry and its historical, contemporary, and social context.

797R. Research. (Arr.)

799R. Doctoral Dissertation. (1-18)

Zoology

Chair: H. Duane Smith, 575 WIDB, 378-2006

Graduate Coordinator: Ferron L. Andersen, 597 WIDB, 378-4145

Faculty/Specialties

Professors

Andersen, Ferron L. (1967) Ph.D., Utah State University, 1963. Parasitology.

Barnes, James R. (1969) Ph.D., Oregon State University, 1972. Aquatic Ecology.

Baumann, Richard W. (1975) Ph.D., University of Utah, 1970. Aquatic Insect Systematics, Biology, and Distribution.

Black, Hal L. (1975) Ph.D., University of New Mexico, 1972. Ecology, Mammology.

Booth, Gary M. (1972) Ph.D., University of California, Riverside, 1969. Insect Physiology, Toxicology.

Bradshaw, William S. (1970) Ph.D., University of Illinois, 1968. Developmental Biology.

Farmer, James L. (1969) Ph.D., Brown University, 1966. Molecular Genetics.

Heckmann, Richard A. (1972) Ph.D., Montana State University, 1970. Fish Diseases, Parasitology.

Heninger, Richard W., Associate Dean (1966) Ph.D., Oklahoma State University, 1961. Physiology, Endocrinology.

Jeffery, Duane E. (1969) Ph.D., University of California, Berkeley, 1972. Ecological and Evolutionary Genetics of Drosophila and Related Organisms.

- Jorgensen, Clive D. (1960) Ph.D., Oregon State University, 1964. Entomology, Ecology, Insect Pest Control.
- Rhees, Reuben Ward (1973) Ph.D., Colorado State University, 1971. Neuroendocrinology.
- Seegmiller, Robert E. (1972) Ph.D., McGill University, 1970. Developmental Biology, Teratology.
- Smith, H. Duane (1969) Ph.D., University of Illinois, 1969. Mammalian Ecology, Wildlife Management.
- Tolman, Richard R. (1982) Ph.D., Oregon State University, 1969. Science Education.
- Van De Graaff, Kent M. (1975) Ph.D., Northern Arizona University, 1973. Comparative Anatomy.
- White, Clayton M. (1970) Ph.D., University of Utah, 1968. Raptor Biology, Ornithology, Avian Systematics and Evolution.
- Winder, William W. (1982) Ph.D., Brigham Young University, 1971. Exercise Physiology and Endocrinology.

Associate Professors

- Braithwaite, Lee F. (1964) Ph.D., Brigham Young University, 1970. Marine Biology.
- Pritchett, Clyde L. (1967) Ph.D., University of Wyoming, 1977. Mammalian Ecology, Wildlife Management.
- Shiozawa, Dennis Kenji (1978) Ph.D., University of Minnesota, St. Paul, 1978. Aquatic Ecology, Limnology, Ichthyology.
- Sites, Jack W., Jr. (1982) Ph.D., Texas A&M University, 1980. Evolutionary Genetics, Vertebrate Biology.
- Smith, Lamont W. (1970) Ph.D., West Virginia University, 1970. Reproductive Physiology of Domestic Animals.
- Whitehead, Armand T. (1969) Ph.D., University of California, Berkeley, 1969. Entomology, Insect Physiology.

Assistant Professors

- Bell, John D. (1990) Ph.D., University of California, San Diego, 1987. Pharmacology, Membrane Physiology.
- Evans, R. Paul (1987) Ph.D., Medical College of Virginia, 1983. Molecular Biology.
- Kaliszewski, Marek J. (1989) Ph.D., Adam Mickiewicz University (Poland), 1981. Phylogenetic Systematics-Acarology.
- Maurer, Brian A. (1986) Ph.D., University of Arizona, 1984. Avian Population and Community Ecology, Ecological Theory, Macroecology.
- Rogers, Duke S. (1989) Ph.D., University of California, Berkeley, 1986. Phylogenetic Systematics-Mammalogy.

Graduate Programs and Degrees

- Biological Science Education (M.S.)
- Entomology (M.S.)
- Wildlife and Range Resources (M.S.)
- Zoology (M.S.)
- Entomology (Ph.D.)
- Wildlife and Range Resources (Ph.D.)
- Zoology (Ph.D.)

Areas of Emphasis

Endocrine physiology, exercise physiology, avian biology, environmental toxicology, mammalian and insect systematics, molecular genetics and cytogenetics, marine and freshwater biology; evolution, developmental biology and teratology; parasitology; molecular biology.

General University Requirements

See General Information section of this catalogue for university requirements that apply to all departments.

Program and Degree Requirements*

All graduate programs in zoology have the same admission and entry requirements.

Admission and Entry

I. Application requirements:

- A. Deadline: March 1 (to receive full consideration for first-round acceptance and awarding of possible financial aid. Applications received by March 1 will normally be acted on by April 1). Statement of intent must explicitly state field of interest and career goals.
- B. Entrance examination: General GRE (Q,V,A) with recommended score of 1600. Scores must be submitted with application to be considered for regular admission.

II. Entry time: Fall semester.

III. Applicants are encouraged to communicate with Zoology Department (575 WIDB) for further information.

Biological Science Education (M.S.)

Admission and Entry: See above application requirements.

Requirements for Degree

- I. Credit hours (30): Minimum 24 approved course work hours plus 6 project hours (Zool. 698R).
- II. Required courses: Zool. 503, Zool. 696R (1 hour).
- III. Project.
- IV. Examinations:
 - A. Oral examination on course work.
 - B. Oral defense of project.

Entomology (M.S.)

Wildlife and Range Resources (M.S.)

Zoology (M.S.)

Admission and Entry: See above application requirements.

Requirements for Degree

- I. Credit hours (30): Minimum 24 hours plus 6 thesis hours (Zool. 699R).
- II. Required courses: Zool. 503, 696R (1 hour).
- III. Thesis: Standard university thesis format or journal publication format.
- IV. Examinations:
 - A. Oral defense of research.
 - B. Oral examination on course work.
 - C. Oral defense of thesis.

Entomology (Ph.D.)

Wildlife and Range Resources (Ph.D.)

Zoology (Ph.D.)

Admission and Entry

- I. Application requirements: See above.
- II. Prerequisite: Master's degree in zoology or equivalent.

Requirements for Degree

- I. Credit hours (42): 42 hours including 18 hours of dissertation (Zool. 799R).
- II. Required courses: Zool. 503 or equivalent; 696R (1 hour).
- III. Skill requirement: Includes 21 hours in skill subject area of foreign languages, mathematics, statistics, and/or computer science. Consult department for details.
- IV. Dissertation: Standard university dissertation format or journal publication format.
- V. Examinations:
 - A. Oral defense of research.
 - B. Written and oral examinations on course work.
 - C. Oral defense of dissertation.

*Obtain a copy of the Graduate Student Handbook from the department office (575 WIDB).

Program and Degree Resources

Benmore Experiment Station
Desert Range Experiment Station
Dugway Proving Grounds
Ephraim Experiment Station
Friday Harbor (Washington) Laboratories
Hopkins Marine Station
Lytle Ranch
M. L. Bean Life Science Museum
Squirrel Meadows

Zoology Graduate Courses

503. Research Orientation. (1)

Departmental graduate procedures; techniques used in researching zoological literature. Students must register for this class the first fall semester of their graduate studies.

504. Research Methodology. (1)

Prerequisite: Zool. 503.

Techniques of zoological research and manuscript preparation.

515R. Science Inservice. (1-5)

Inservice course for science teachers.

526. (Zool.-Botny.) Cell Biology. (3)

Prerequisite: introductory course in biochemistry.

Molecular physiology and ultrastructure of cells, emphasizing eukaryotic organisms.

534. Economic Entomology. (3)

Prerequisite: Zool. 331.

Principles of integrated pest management of arthropod pests.

535. Medical Entomology. (3)

Prerequisite: Zool. 331.

Arthropods and arachnids that affect the health of man and domestic animals.

536. Comparative Toxicology. (3)

Prerequisite: general biology and a course in organic chemistry.

Modes of action and biological transformations of pesticides in living animals, plants, and the environment, emphasizing techniques.

537. Aquatic Entomology. (2)

Recommended: Zool. 331.

Morphology, classification, biology, and functional ecology of aquatic insects.

538. Immature Insects. (2)

Recommended: Zool. 331.

Morphology, systematics, and biology of immature insects.

549R. Advanced Topics in Zoology. (1-4) On dem.

Prerequisite: consent of instructor.

Topics vary. See Class Schedule.

552. (Zool.-Botny.-Range) Terrestrial and Rangeland Ecosystems. (4)

Prerequisite: Zool.-Botny. 350 or equivalent, Stat. 221 or 501.

Biotic communities of the earth; population dynamics; reproductive, life-form, and longevity patterns; species interactions; structure, dynamics, and evolution of communities.

556. Limnology. (4)

Prerequisite: Zool. 350.

Biotic and physical-chemical properties of lakes and streams. Saturday field trips required.

560. Advanced Human Anatomy. (2)

Prerequisite: Zool. 260 or 363 and consent of instructor.

Anatomical facts of clinical significance, with opportunity to dissect cadavers.

565. Endocrinology. (3)

Prerequisite: Zool. 460 or equivalent.

Study of mammalian hormones.

566. Experimental Endocrinology. (2)

Prerequisite: Zool. 565 or concurrent registration.

Techniques used in research.

579R. Advanced Topics in Genetics. (1-4) On dem.

Topics vary. See Class Schedule.

584. (Zool.-Psych.) Neurophysiology. (3)

Prerequisite: Zool. 460 or equivalent.

Physiology of nerve cells and neuronal interactions.

591R. Special Problems in Zoology. (1-2)

Prerequisite: consent of instructor.

601. Zoogeography. (2)

Distribution of animals; patterns and causes.

602. Theoretical Ecology. (4)

Theoretical foundations of evolutionary ecology; emphasizes understanding ecological theory.

603. Ecological Data Analysis. (4)

Prerequisite: Stat. 501.

Practical quantitative methods necessary to analyze ecological data. Use of computer software for statistical analysis.

604. Phylogenetic Systematics. (3)

Theoretical foundations of modern systematics; includes methods of phylogenetic inference.

605. Molecular Methods in Systematics and Population Biology. (5)

Introduction to current molecular methods in systematics and population biology; emphasis on laboratory techniques in isozyme analysis.

633R. Advanced Topics in Entomology. (1–2) On dem.

Prerequisite: consent of instructor.

Topics vary. See Class Schedule.

657R. Advanced Topics in Animal Ecology. (2) On dem.

Prerequisite: Zool. 350.

Topics vary. See Class Schedule.

662R. Advanced Topics in Physiology. (2)

Prerequisite: Zool. 460.

Topics vary. See Class Schedule.

663R. Experimental Physiology. (2)

Prerequisite: Zool. 460.

Topics vary. See Class Schedule.

696R. Graduate Seminar. (0.5)

Topics vary. See Class Schedule.

698R. Master's Project. (Arr.)**699R. Master's Thesis.** (Arr.)**799R. Doctoral Dissertation.** (Arr.)



Campus Facilities and Opportunities

Cultural and Recreational Resources

One of the cultural centers of the intermountain region, Brigham Young University offers a wealth of opportunities for students and community members interested in the cultural arts. Already the home of two major museums—the Monte L. Bean Life Science Museum and the Museum of Peoples and Cultures—the university will soon have an exceptional new facility to house its large art collection.

In addition to maintaining a variety of theatres, concert halls, and art galleries for study and performance in drama, music, dance, and the visual arts, BYU sponsors performing arts series that bring to the campus some of the world's most acclaimed musicians. Other offerings include the Honors Program cultural arts series and the International Cinema, which shows foreign films weekly. Moreover, BYU supports a professional motion picture studio and an educational television station and FM radio station that broadcast a wide spectrum of programs.

Of prime importance are the general forums and devotional assemblies, which, on selected Tuesdays at 11 a.m., draw together the entire campus to be addressed by prominent Church and national figures. BYUSA-sponsored lectures and college and department-sponsored lectures by noted scholars also enhance learning.

BYU has an exceptional athletic program, which has achieved national prominence in recent years in men's basketball, football, and golf and women's volleyball and tennis. The Marriott Center, the second largest on-campus indoor arena in the nation, seats 23,000; and the football stadium seats 65,000. Opportunities abound for the participant as well as the spectator through BYU's large intramural program, in which thousands of students participate in 60 different events. BYU also has an extensive extramural program in sports such as lacrosse, softball, and soccer.

Situated at the foot of the Wasatch Mountains, BYU offers students a wealth of outdoor recreational opportunities, including some of the best skiing and hiking in the world. Furthermore, Utah's vast desert wilderness and canyon country begins just a few hours from the campus.

Just 45 miles north of Provo is Salt Lake City, home of numerous theatrical, dance, and musical groups, among them Ballet West and the Utah Symphony.

Campus Services of Interest to Graduate Students

Note: Most specific services for graduate students are provided at the departmental level; therefore, the following items present only the most general information. Information related to specific interests, such as employment in a particular department, is available in individual departments.

Campus Privileges for Graduate Students

Graduate students who are registered for at least 2 hours per semester or 1 hour per term receive a university (ID) activity card and are eligible for all on-campus privileges

afforded students who are registered full-time, i.e., eligibility for on-campus employment, student housing, student insurance, intramurals, use of physical education facilities, graduate parking permits, and discount admission to sporting and cultural events.

ID Center

333 ELWC, 378-5092

The ID (Identification) Center provides BYU photo identification cards to BYU students. When properly validated for the current semester or term, these cards allow students the campus privileges described above. During the first two weeks of each semester or term, the photo ID cards are produced and the activity validation is provided in a designated place in the Wilkinson Center. Thereafter, cards are available at the ID Center. All ID distribution and validation locations also serve as screening areas for the dress and grooming standards outlined by the university.

Information Systems Services

167 TMCB, 378-5025

Information Systems Services provides extensive computing and micrographics facilities for faculty, staff, and student use. Experienced personnel, a sizeable library of computer programs, and state of the art equipment are available to assist with particular problems and training.

Media Services

Managing Director: Dean VanUitert, 290 FB, 378-5999

Media Services provides instructional and technological support for academic and entertainment activities throughout campus. Instructional Graphics services include graphic design, desktop publishing, presentation graphics, photographic production, consultation, and multimedia presentations. Audiovisual Services offers an extensive collection of films, audio recordings, and video tapes, as well as recording, display, and projection equipment. Electronic Media supplies campuswide support for the design, installation, and maintenance of electronic, data, and communications systems.

Student Life

Opportunities available through the extracurricular division of the university called Student Life are many and varied, ranging from student (BYUSA) functions and activities to counseling and health services.

Dean of Student Life: Maren M. Mouritsen, Assistant

Vice-President, 380 SWKT, 378-4668

Associate Dean: Ryan L. Thomas, 380 SWKT, 378-4771

Assistant Dean: Tamara M. Quick, 329 ELWC, 378-3111

Ernest L. Wilkinson Center

At the Ernest L. Wilkinson Center students may relax and participate in out-of-class activities that will foster personal enjoyment and growth. The center is also the head-

quarters for BYU Student Association service opportunities and activities.

The games center, bowling alleys, copy center, computer facilities, photo studio, barbershop, post office, lost and found department, and outdoor rental operation are all on the first level. Facilities on the second level (main floor) include ballrooms, reading and stereo rooms, a television area, and a movie theater. The Wilkinson Center also includes the university bookstore, a restaurant, snack bar, and cafeteria.

Bookstore

The BYU Bookstore, housed in the Ernest L. Wilkinson Center, offers a variety of merchandise and services to students, faculty, and staff. Textbooks, school supplies, and a large selection of trade books constitute most of the stock, but students can also buy such items as computer hardware and software, art and office supplies, gifts, cosmetics, clothing and sportswear, records and stereos, cameras, athletic supplies, and video equipment. The Bookstore offers other services such as check cashing and film processing as well.

Religious Opportunities

Students have many excellent opportunities to participate in religious activities at BYU.

BYU Wards and Stakes. The Church of Jesus Christ of Latter-day Saints is organized on campus into a number of stakes composed of several wards (congregations) of 200 to 300 members each. The stakes and wards are organized specifically to give individuals maximum opportunity for Church activity. Spiritual growth and a strong testimony of the divinity of Jesus Christ are goals fostered by the campus stake and ward organizations, whose programs are correlated at all levels with the activities of the university.

All single students living away from home who are members of The Church of Jesus Christ of Latter-day Saints become members of one of the BYU wards. Married students not living in university housing may attend either a BYU ward or the city ward in which they live.

Other Religious Denominations. Approximately 25 other religious denominations are represented by BYU students. These students are encouraged to attend the congregation of their faith in the Provo area.

Devotionals and Firesides. On selected Tuesdays at 11 a.m. throughout the year, General Authorities and other leaders of the Church speak to a general assembly of faculty and students in the Marriott Center. Their timely messages remind students of the importance of the spiritual dimension in education and encourage commitment, faith, and moral behavior. Furthermore, once a month, usually the first Sunday evening, Church leaders speak to students in fireside services.

Student Health Center

Director: Clyde E. Sullivan, 170 MHC, 378-2771

Student health services are available to all students at the Howard S. McDonald Student Health Center. Hospitalization, when necessary, is available locally at the Utah Valley Regional Medical Center. The Health Center offers emer-

gency care, consultation with nurse practitioners or physicians by appointment, immunization, pharmacy service, physical therapy, laboratory tests, and X-ray examinations. A brochure describing student health and insurance plans is available at the Health Center.

Counseling and Development Center

Director: David M. Sorenson, 149 SWKT, 378-3035

The Counseling and Development Center provides a variety of counseling, instruction, and other support services. Personal and group counseling help students to develop individual responsibility and self-reliance in resolving concerns that impede effective functioning within the university setting. Stress management services help students to identify sources of stress and more effectively handle these pressures. A twenty-four-hour emergency counseling service is provided to deal with crisis situations. Other services include workshops, career and learning information, and testing.

Multicultural Services

Director: Rush Sumpter, 329 ELWC, 378-3111

Students come to BYU from each of the 50 states as well as from more than 70 foreign countries. Because of the large number of international students, the Office of Multicultural Programs administers and conducts programs designed to help minority and international students succeed by providing these students with support functions critical to their welfare at the university. These functions include services in the following three areas:

1. International Student Office

Advisor: Enoc Q. Flores, 366 SWKT, 378-2695

This office provides advisement and services to all international students, visitors, exchange scholars, aliens with permanent residence in the United States, and other interested parties within the university community.

2. Academic Support Office, 350 SWKT, 378-3821

Personnel in this office offer minority and international students academic and personal advisement and tutoring help.

3. Financial Aid, 351 ELWC, 378-3065

The office assists American Indian students in securing tribal funds.

Nontraditional Students

380 SWKT, 378-2731

The Nontraditional Student Office welcomes students twenty-five and older who are returning to college after a long break or beginning their university education at a mature age. To help ease the transition from nonstudent to student status, the office directs students to resources and services available on campus and in the community that may meet their needs. BYUSA, telephone 378-3901, sponsors a support group in which interested nontraditional students can meet together regularly. It also organizes occasional activities of particular interest to the nontraditional student.

Handicapped Student Services

Advisor: Teri Jensen, 390 SWKT, 378-2767

BYU offers a variety of services for students with physical or learning disabilities. Hearing-impaired students have access to classroom interpreters, Com-Teks, and TDD communications. Visually impaired students are provided with volunteer readers, Visualteks, a talking computer with enlarged screen print, taped textbooks, and braille writers. Mobility-impaired students receive academic counseling and advisement and help with arranging access to buildings on campus. Learning disabled students are helped by free assessment, volunteer readers, taped textbooks, and other appropriate services.

Veterans Support Office

380 SWKT, 378-2768

The Veterans Support Office certifies the enrollment of eligible veterans or their dependents for educational benefits from the Veterans Administration. Information and assistance in applying for these benefits is available from this office.

Ombudsman

BYUSA, 437 ELWC, 378-4132

The Ombudsman's Office investigates and expresses conclusions when a student is aggrieved by an official's action or inaction and acts as an impartial mediator in resolving disputes between students and businesses, organizations, or individuals. Basic legal advice is also provided by this office.

University Police and Traffic

B-66 ASB, 378-2222 (Emergency 911)

The University Police Department is established for the benefit and protection of students, faculty, and staff. The department's state-certified police officers are entrusted with enforcing laws and campus rules and regulations.

All routine matters requiring police assistance should be directed to this office by calling 378-2222.

Vehicle Registration and Parking Permits

GRNH, 378-3906

Parking and traffic control are the responsibility of the University Police Traffic Services, located in the Traffic Office east of the Carillon Bell Tower on 1430 North. All BYU students who intend to park in student lots during restricted hours (7 a.m.-4 p.m., Monday through Friday) must register their motor vehicles with the Traffic Division and obtain a parking permit.

A limited number of graduate G parking permits are available on a first-come, first-served basis. Other permits are also available.

Out-of-State Plates

Students driving vehicles with out-of-state plates should check with the Traffic Office regarding state and university regulations.

Bicycle Registration

All bicycles that are operated, parked, or stored on campus by any student, employee, or visitor must display a current bicycle license from a Utah County city. The fee for a Provo bicycle license is \$1. Provo city bicycle licenses can be obtained at the Traffic Office or at the Provo City Center, 359 West Center.

Other Regulations

Traffic and bicycle rules and regulation booklets are available at no charge from the Traffic Office. All students, faculty, and staff members are responsible for the information in these booklets.

Housing

Housing Office

C-141 ASB, 378-2611

Student housing is available both on campus and in the surrounding communities; policies have been established within campus residence halls and with off-campus landlords to integrate living experiences with the complete educational experience.

Campus Housing: Single Students

Campus housing for single students includes room-and-board residence halls and apartment-type facilities. Helaman Halls and Deseret Towers, the two residence hall complexes, reserve specific floors for graduate students desiring room-and-board housing. Each hall contains student rooms, study rooms, recreation areas, central shower areas, laundry and storage facilities, and a head-resident apartment. The central buildings for Deseret Towers and Helaman Halls feature cafeterias, dining rooms, reception areas, post offices, computer rooms, a reading and writing laboratory, and vending facilities for the entire residence area.

Heritage Halls provides housing for women and men in twenty-four apartment-type buildings. Each apartment has a combination kitchen-dining-study room, three bedrooms, and a bath. In addition, there are large living rooms, a recreation room, a head resident apartment, and laundry and storage facilities in each building. Usually, six people live in each apartment. The apartments are completely furnished except for bedding and kitchen items.

One other option for single students lies in the Foreign Language Houses. The College of Humanities sponsors residences where students pledge to speak only the foreign language in the house while they live and study together under the supervision of a faculty advisor and a native speaker. Participating graduate students sometimes serve as interns or instructors in these houses. For details students should write or call the foreign language departments listed in this catalogue or the director of Foreign Language Housing, 2054 JKHB, telephone 378-5038.

Campus Housing: Student Families

Family accommodations for 968 student families are provided in Wymount Terrace and Wyview Park. Wymount Terrace consists of family apartments arranged around lawn areas and playgrounds. Each apartment is furnished with an electric or gas range, refrigerator, drapes, and

garbage disposal. A limited amount of furniture is available for rent from the university. These apartments are not plumbed or wired for washers and dryers, but the complex has five self-service laundry centers. Four apartment sizes are available, assigned according to family size.

Wyview Park consists of one-, two-, and three-bedroom mobile homes placed on permanent foundations and connected to power, water, and sewer lines to provide the conveniences of permanent homes. Each unit is equipped with air conditioning, refrigerator, garbage disposal, built-in gas range, carpeting in the living room and bedrooms, and built-in chests of drawers. A laundromat, children's play area, adult recreation area, community assembly room, community park, and dairy products outlet are also all nearby.

Applications for Campus Housing

Students who plan to enroll at BYU and live in a university residence hall or a student family complex are advised to obtain the appropriate housing application from the Office of Student Housing at least one year in advance.

The completed application should then be returned to the university with the appropriate fee: \$25 for single student housing and \$10 for family student housing. Housing assignments and agreement forms are prepared according to the date the application is received by the Housing Office; they are mailed in late spring or early summer.

Validation of any campus housing reservation is, of course, contingent upon the student's official acceptance and admission to the university. Agreements are usually made for the academic school year (two semesters), but graduate students may sign contracts for individual semesters.

Off-Campus Housing

110 GRSB, 378-5066

The BYU Off-Campus Housing Office aids students in finding off-campus housing, encourages landlords of university-approved housing to maintain and improve rental facilities, advises students and landlords in their relationships with one another, and attempts to assure that BYU living standards are maintained in university-approved off-campus rentals. Unmarried BYU graduate students and married students are encouraged to live in university-approved housing but are not required to. At present, more than 24,000 rental spaces have been approved by the university for off-campus living.

BYU Housing Referral Service

The Off-Campus Housing Office maintains a complete referral service for all university-approved rental facilities. Thousands of rental units of all types are available, including large apartment complexes, condominiums, duplexes, houses, basement apartments, and sleeping rooms. Some housing for student families is also listed, though family student housing is not subject to university approval.

Detailed lists of current vacancies are available at the Housing Information Window, C-141 ASB, from 8 a.m. to 5 p.m. Monday through Friday. Because such lists are constantly updated, they are not sent to prospective renters through the mail. However, a guide with essential rental data on the large apartment complexes will be mailed on request. Counselors are also available to help students who have problems finding suitable off-campus housing.

Catalogue Terms and Abbreviations

The following terms and abbreviations are used throughout the catalogue.

Course Number. This catalogue does not list courses numbered below 500. For listings of undergraduate courses, see the BYU General Catalogue. Courses numbered below 500 are undergraduate courses, courses numbered 500–599 are either graduate courses or advanced undergraduate courses, and courses numbered 600 and above (600–799) are graduate courses. Most, but not all, 500-level courses can count toward a graduate degree. Restrictions and limitations are noted in the Credit Policies section of this catalogue and also in the program requirements for each department.

Credit Hour Designation. The number that follows each course title is the number of semester hours of credit designated for the class.

Abbreviations and Symbols. The following abbreviations and symbols are used in the course listings:

Abbreviations	Designation
Arr.	Credit, class, or laboratory hours are arranged through consultation with department or instructor
ea.	Credit hour designation applies to each registration
R	Designates a course that may be repeated for credit
□	Cross-referenced course—one that originates in one department but may count for credit in another
(19 __)	Date faculty member was hired
Alt. sem.	Course is offered alternate semesters
Alt. term	Course is offered alternate terms
Alt. yr.	Course is offered alternate years
Even yr.	Course is offered even years
Odd yr.	Course is offered odd years
On dem.	Course is offered "on demand," that is, when enough students request it to justify offering it

Areas of Study	Abbreviations	Areas of Study	Abbreviations
Accounting	Acc.	Health Sciences	Hlth.
Agronomy and Horticulture	AgHrt.	History	Hist.
American Sign Language	ASL	Humanities	Hum.
Animal Science	AnSc.	Classics	Clscs.
Anthropology	Anthr.	Classical Civilization	ClCv.
Art	Art	Comparative Literature	CLit.
Botany and Range Science	Botny., Range	Industrial Education	IndE.
Chemical Engineering	ChEn.	Instructional Science	IS
Chemistry	Chem.	International and	
Civil Engineering	CivE.	Area Studies	IAS
Clothing and Textiles	CITx.	Languages	
Communications	Comms.	Arabic	Arab.
Computer Science	CS	Chinese	Chin.
Design	Des.	French	Fren.
Economics	Econ.	German	Germ.
Educational Leadership	ELdr.	Hebrew	Heb.
Educational Psychology	EPsy.	Italian	Ital.
Elementary Education	EIEd.	Portuguese	Port.
Electrical and Computer		Russian	Russ.
Engineering	ECEn.	Scandinavian	Scand.
English	Engl.	Spanish	Span.
Family Sciences	FamSc.	Law School	Law
Food Science and		Library and Information	
Nutrition	FSN	Sciences	LIS
Geography	Geog.	Linguistics	Ling.
Geology	Geol.		

Areas of Study

Teaching English as a
Second Language
Management Communication
Managerial Economics
Manufacturing Engineering
Technology
Mathematics
Mechanical Engineering
Microbiology
Nursing
Organizational Behavior
Philosophy
Physical Education—Dance
Physical Education—Sports
Physical Science
Physics and Astronomy

Abbreviations

ESL
MCom.
ManEc.

MfET.
Math.
MeEn.
Mcbio.
Nurs.
OrgB.
Phil.
PE—D
PE—S
PhyS.
Phscs.

Areas of Study

Psychology
Political Science
Public Management,
Institute of
Recreation Management
Religious Education
Ancient Scripture
Church History and
Doctrine
Secondary Education
Social Work
Sociology
Statistics
Theatre and Film
Youth Leadership
Zoology

Abbreviations

Psych.
PLSc.

PMgt.
RecM.

RelA.

RelC.
ScEd.
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Soc.
Stat.
ThF.
YthL.
Zool.

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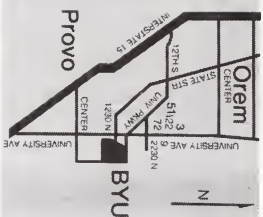
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